VIDEO 81

Bestell-Nummer 065,280 0

SERVICE MANUAL Video 8

For MECHANISM ADJUSTMENTS, refer to the "MECHANISM SERVICE MANUAL (8mm CAMCORDER A-MECHA)"

SPECIFICATIONS

System

Video recording system	Rotary two-head, Helical scaning FM system
Audio recording system	Rotary head, FM system
Video signal	PAL Color, CCIR Standards
Usable tape	8mm Video format tape
Tape speed	SP mode: Approx. 20.051mm/sec. LP mode: Approx. 10.058mm/sec.
Recording/ Playback time	SP mode: 1 hour and 30 minutes (P5-90) LP mode: 3 hours (P5-90)
Fast-forward/rewind time	Approx. 8 min (P5-120)
Image device	1/3" CCD 320,000 pixels
View finder	Electronic View finder (BLACK AND WHITE)
Lens	Combined 8×power zoom lens f=7mm-56mm
Auto focus system	Infrared rays
White balance	Automatic, HOLD, IN DOOR, OUT DOOR
Minimum illumination	3 lux
Illumination range	3~100,000 lux
Apeture correction	Automatic back light adjustment
Recommended illumination	More than 150 lux

Input and output connector

Video output	Phono jack, 1 Vp-p, 75 ohms unbalanced sync negative
Audio output	Phone-jack Output: −7.5dBs, at output impedance less than 1 kilohms
RFU DC OUT	Special minijack, 5 V DC
Earphone jack	Minijack, 8-ohm impedance
Remote jack	Mini-minijack
MIC jack	Minijack, −66 dBs, low impedance With 2.5 to 3V DC output, impedance 6.8 kilohms

8 VIDEO CAMERA RECORDER
DAEWOO ELECTRONICS

Quelle

General

Power requirements	On battery mounting surface 6.0V (battery pack) 7.5V (AC power adaptor) 9.0V (alkaline batteries)
Power consumption	6.8W (camera recording) including the viewfinder
Operating temperature	0°C to 40°C
Storage temperature	−20°C to +60°C
Dimensions	Approx. 108×138×311 mm (w/h/d) including the lens hood
Weight	Approx. 1.1kg excluding the battery and cassette
Microphone	Electric condenser microphone. omni-directional monaural type

Supplied Accessories

The camcorder is packed together with the following accessories. Check to see that everything is contained in the package.

- AC power adaptor (VA-33A)
- DC output cable (VA-30DC)
- Lithium battery (CR-2025)
- Shoulder trap (VA-30BS)
- Battery pack (NP-55)
- Cable CANEL RCA JACK (PERI-RCA)
- Instruction Manual

SAFETY CHECK-OUT

After correcting the original service problem, perform the following safety checks before releasing the set to the customer:

1. Check the area of your repair for unsoldered or poorly-soldered connections. Check the entire board surface for solder splasher and bridges.

2. Check the interboard wiring to ensure that no wires are "pinched" or contact high-wattage resistors.

3. Look for unauthorized replacement parts, particularly transistors, that were installed during a previous repair. Point them out to the customer and recommend their replacement.

4. Look for parts which, though functioning, show obvious signs of deterioration. Point them out to the customer and recommend their replacement.

5. Check the B+ voltage to see it is at the values specified.

SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY MARK ⚠ OR DOTTED LINE WITH MARK ⚠ ON THE SCHEMATIC DIAGRAMS ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH DAEWOO PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY DAEWOO.

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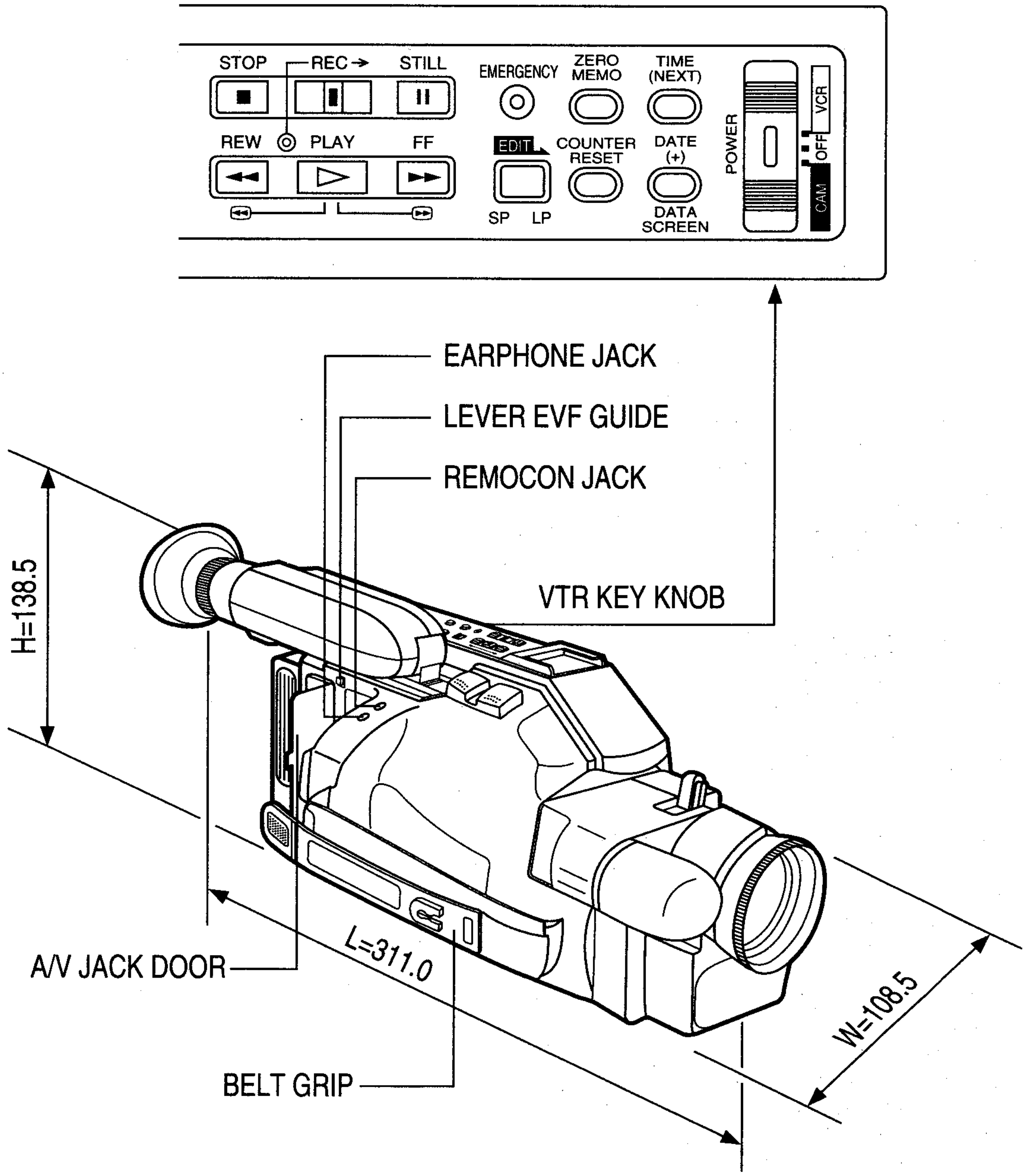
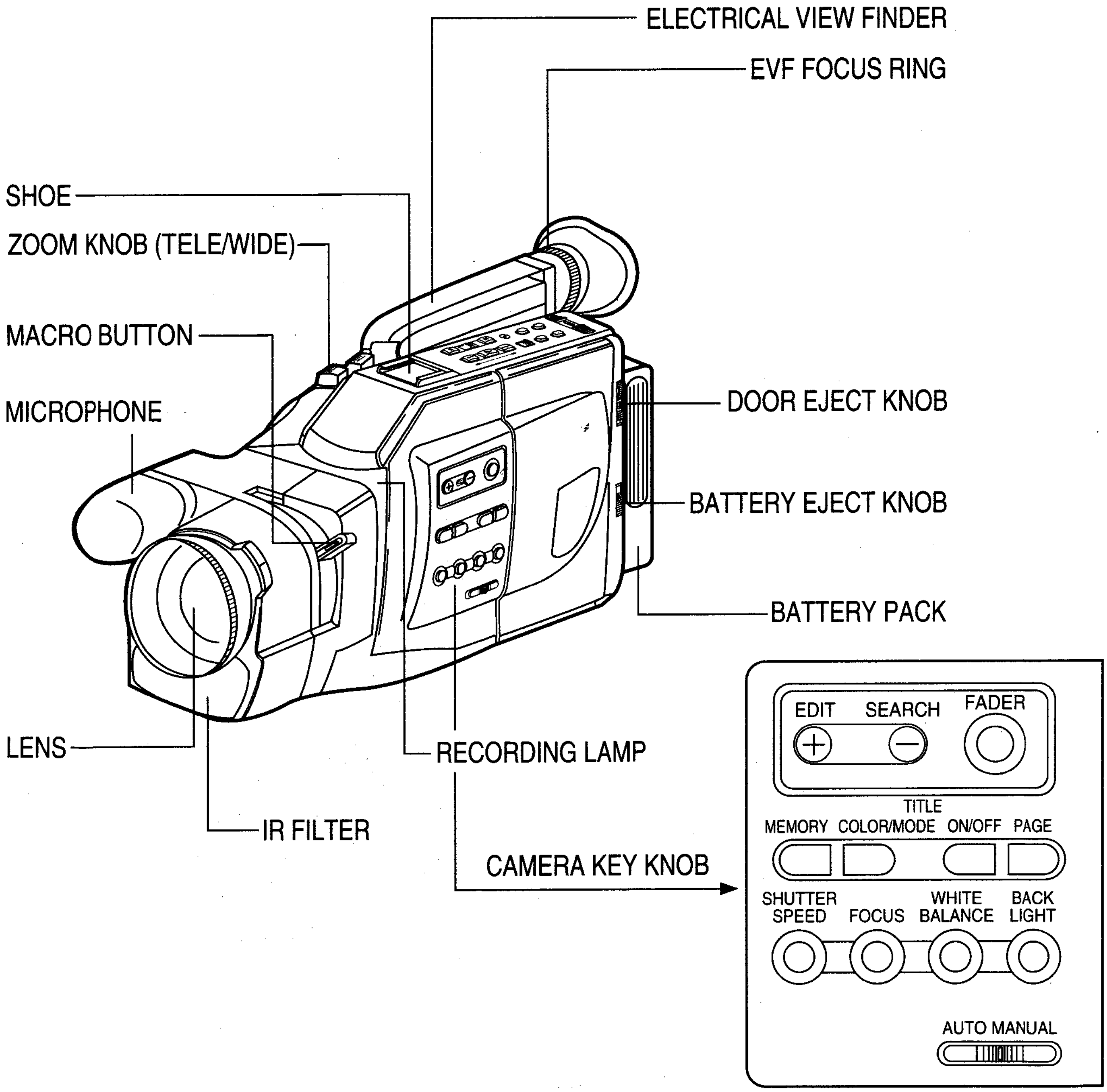
1. DISASSEMBLY

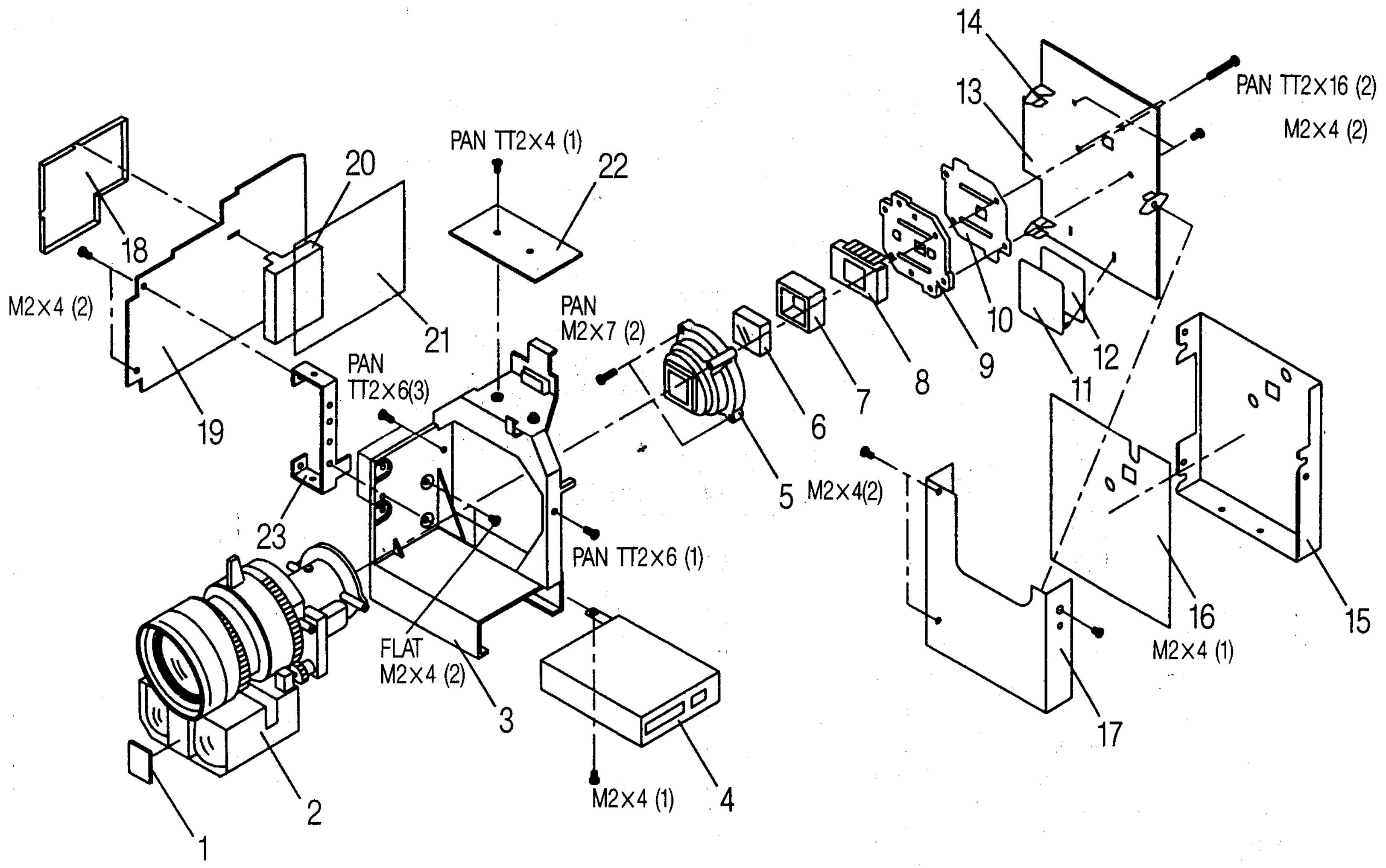
1-1. SET TOTAL ASSEMBLY


STOP
REC→
STILL
EMERGENCY
ZERO MEMO
TIME (NEXT)
REW
PLAY
FF
EDIT
COUNTER RESET
DATE (+)
SP LP
DATA SCREEN
POWER
VCR
OFF
CAM
EARPHONE JACK
LEVER EVF GUIDE
REMOCON JACK
VTR KEY KNOB
H=138.5
A/V JACK DOOR
L=311.0
BELT GRIP
W=108.5


ELECTRICAL VIEW FINDER
EVF FOCUS RING
SHOE
ZOOM KNOB (TELE/WIDE)
MACRO BUTTON
MICROPHONE
DOOR EJECT KNOB
BATTERY EJECT KNOB
BATTERY PACK
LENS
RECORDING LAMP
IR FILTER
CAMERA KEY KNOB
EDIT
SEARCH
FADER
+
−
TITLE
MEMORY
COLOR/MODE
ON/OFF
PAGE
SHUTTER SPEED
FOCUS
WHITE BALANCE
BACK LIGHT
AUTO MANUAL

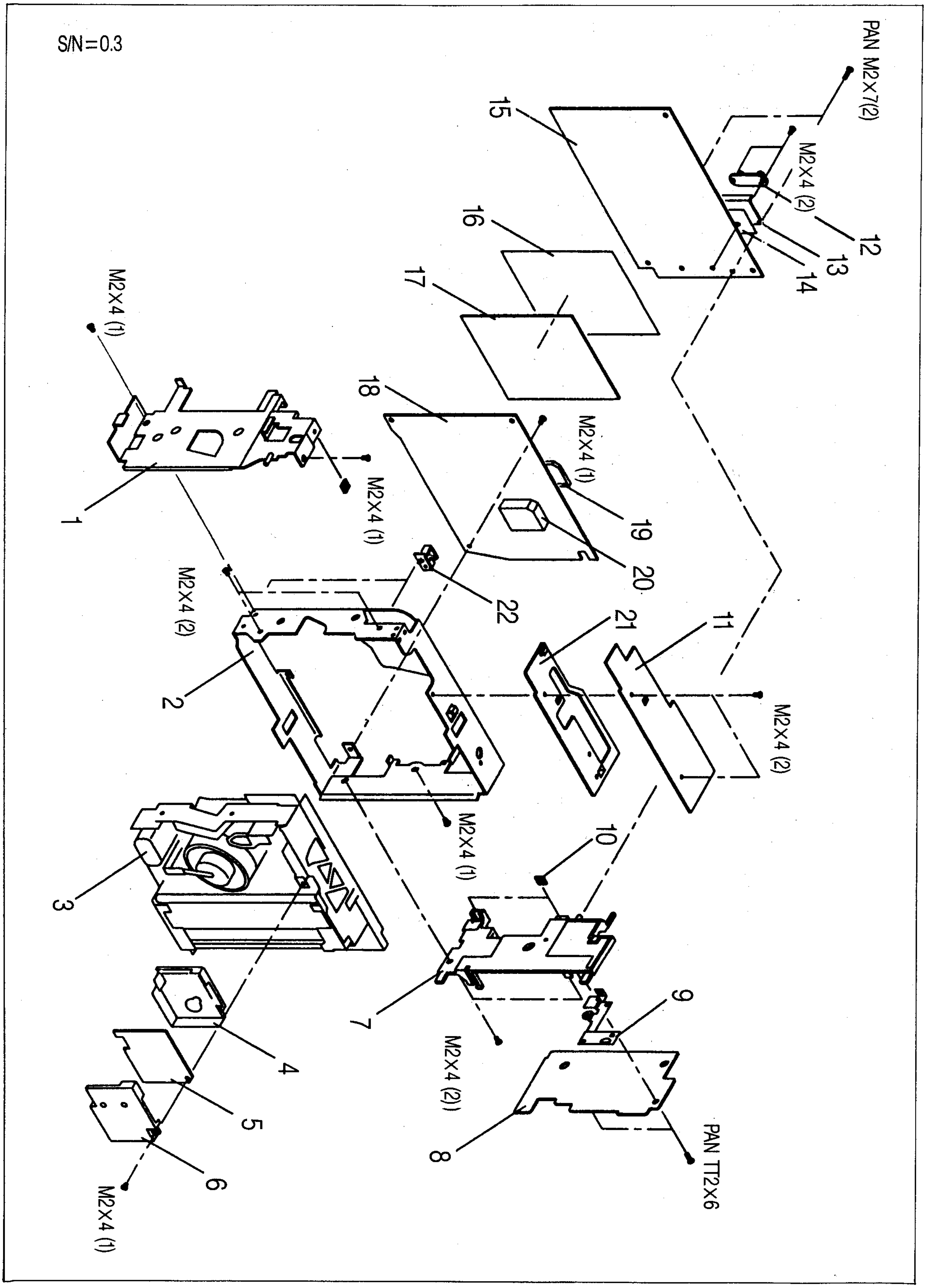
1-2. CAMERA BLOCK DISASSEMBLY

S/N=0.4


14
13
PAN TT2×16 (2)
M2×4 (2)
PAN TT2×4 (1)
22
20
18
M2×4 (2)
21
19
PAN
M2×7 (2)
PAN
TT2×6(3)
10
12
9
8
7
6
11
5
M2×4(2)
23
PAN TT2×6 (1)
FLAT
M2×4 (2)
3
16
M2×4 (1)
15
17
M2×4 (1)
4
2
1

NO	PART CODE	PART NAME	Q'TY	DESCRIPTION
1	97P0C00200	SPONGE FILTER	1	SPONGE T1.0
2	97PB141200	CAMERA LENS AS	1	
3	97P0606800	FRAME LENS	1	ABS
4	97PB141500	DC/DC AS	1	
5	97P2326900	HOLDER CCD	1	PC
6	97P8900100	OPTICAL FILTER L.P	1	
7	97P4209300	RUBBER LPF	1	RUBBER
8	11CX044BKA	IC CCD IMAGER	1	
9	97P0939200	PLATE AL CCD	1	AL T2.0
10	97P5601300	INSUL. PLATE CCD	1	PVC T0.2
11	97P3302500	SHIELD CASE IC	1	ET T0.2
12	97P5601500	INSUL. IC	1	PVC T0.2
13	97P6538910	PCB CAD-10	1	FR-10
14	97P2434300	BRKT S/C GUIDE	3	SPCC T0.5
15	97P3302400	SHIELD COVER CAD	1	ET T0.2
16	97P5601500	INSUL. PLATE CAD	1	ET T0.2
17	97P3302300	SHIELD CASE CAD	1	ET T0.2
18	97P3302700	SHIELD COVER CAP	1	ET T0.2
19	97P6538909	PCB CAP-10	1	FR-10
20	97P3302600	SHIELD CASE CAP	1	ET T0.2
22	97P6538912	PCB CS-10	1	FR-10
23	97P2434400	BRKT LENS FRAME	1	SECC T0.8

1-3. MAIN BOARD DISASSEMBLY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M2×4 (2)
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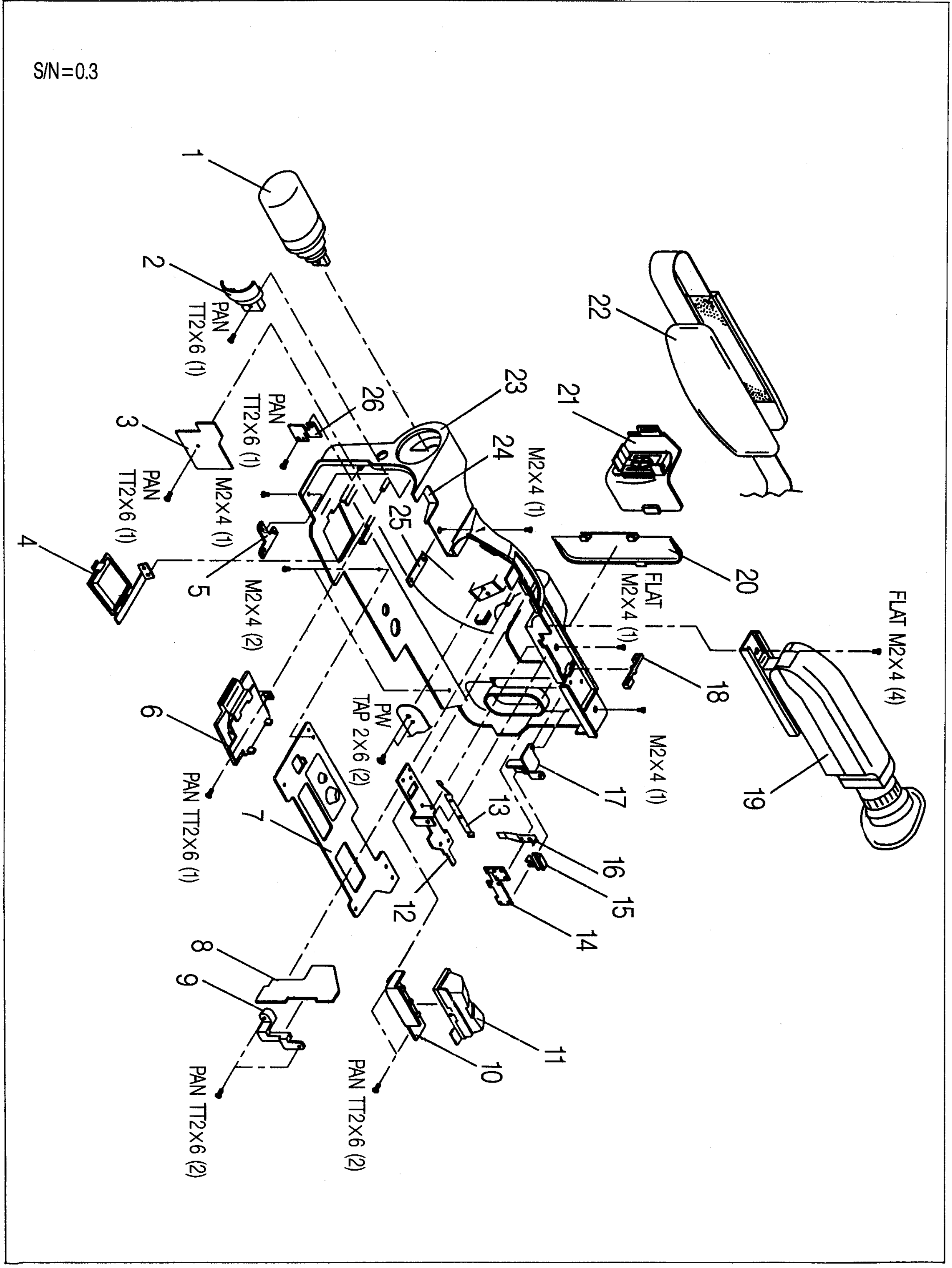
13
14
15
16
17
18
M2×4 (1)
19
20
M2×4 (1)
M2×4 (1)
1
M2×4 (2)
22
21
11
M2×4 (2)
2
M2×4 (1)
10
3
7
9
4
5
M2×4 (2)
8
PAN TT2×6
6
M2×4 (1)

NO	PART CODE	PART NAME	Q'TY	DESCRIPTION
1	97P0607000	FRAME DECK FNT	1	ABS
2	97PB152600	DECK FRAME AS	1	AL T1.0
3	97PB140900	DECK AS	1	
4	97P3302100	SHIELD CASE HA	1	ET T0.3
5	97P6538903	PCB HA-10	1	FR-10
6	97P3302200	SHIELD COVER HA	1	ET T0.3
7	97P0606900	FRAME MC	1	ABS
8	97P6538904	PCB MC-10	1	FR-10
9	97P0939600	PLATE GROUND	1	ET T0.2
10	97P2434000	BRKT SCREW GUIDE	3	SECC T1.0
11	97P6538906	PCB VK-10	1	FR-10
12	97PA274400	AV JACK AS	1	
13	97P2433800	BRKT AV JACK	1	SECC T1.0
14	97P0942600	PLATE AV JACK	1	PVC T0.2
15	97P6538901	PCB VA-10	1	FR-10
16	97P0946000	PLATE TWB	1	PE+AL+PE
17	97P6538911	PCB TWB-10	1	FR-10
18	97P6538902	PCB SS-10	1	FR-10
19	97P3301800	SHIELD COVER SS	1	ET T0.3
20	97P3301700	SHIELD CASE SS	1	ET T0.3
21	97P0607100	FRAME VK	1	ABS
22	97P2506800	SUPPORTER SS	2	NYLON 66

1-4. CABINET (R) DISASSEMBLY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PAN TT2×6 (1)
M2×4 (1)
PAN TT2×6 (1)
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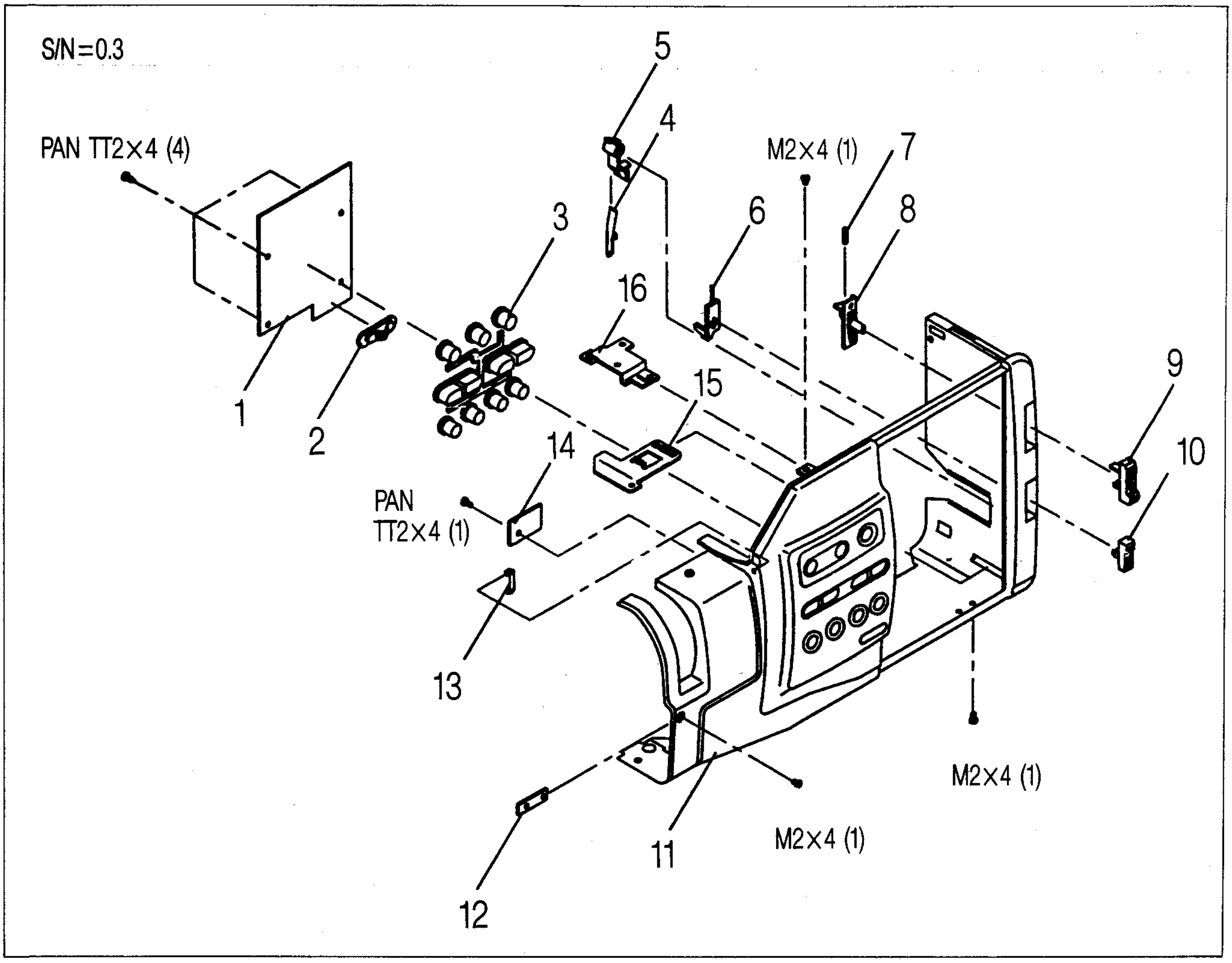
23
4
5
M2×4 (2)
24
25
M2×4 (1)
21
22
20
FLAT M2×4 (1)
FLAT M2×4 (4)
18
19
6
PAN TT2×6 (1)
PW TAP 2×6 (2)
7
M2×4 (1)
17
13
12
16
15
14
8
9
PAN TT2×6 (2)
10
11
PAN TT2×6 (2)

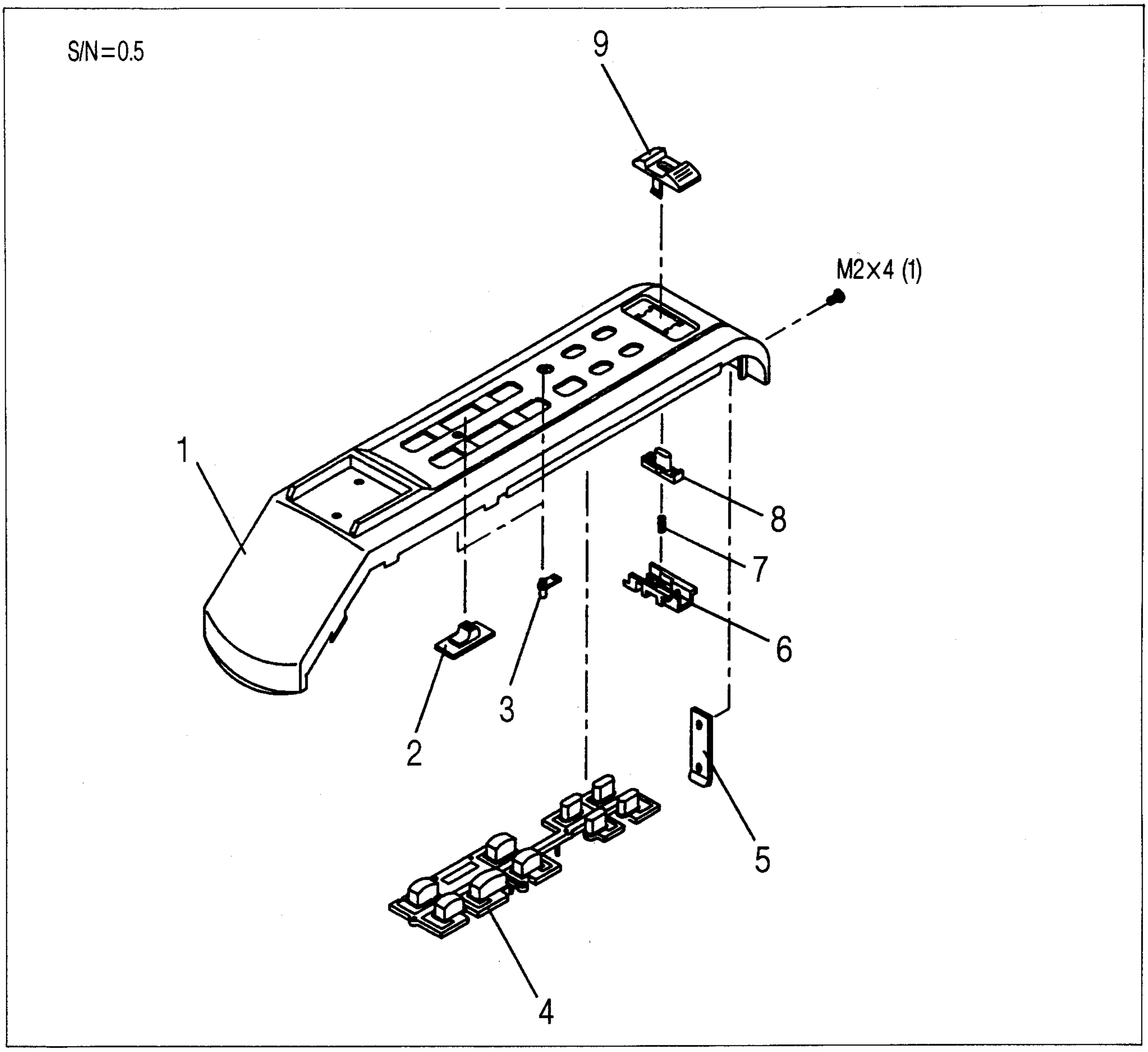
NO	PART CODE	PART NAME	Q'TY	DESCRIPTION
1	97PA273900	MIC AS	1	
2	97P0102200	CABINET MIC FIXED	1	ABS
3	97P6538905	PCB MA-10	1	FR-10
4	97P1811400	DOOR LT BATT	1	PP
5	97P2434700	BRKT IR CAP	1	SECC T0.8
6	97PA274300	LITHIUM BATT AS	1	
7	97PA277400	BRKT STAND AS	1	SPCC T1.2
8	97P6538907	PCB RS-10	1	FR-10
9	97P2326300	GUIDE RS PCB	1	ABS
10	97P0939500	PLATE Z/K GUIDE	1	ABS
11	97PA274200	ZOOM AS	1	
12	97P2434800	BRKT EVF GUIDE	1	SECC T0.8
13	97P0939400	PLATE EVF GUIDE	1	SUS304 T0.2
14	97P2326200	HOLDER AV DR/PLT	1	ABS
15	97P1325300	KNOB AV IN/OUT	1	ABS
16	97P0939300	PLATE AV DOOR	1	SUS304 T0.2
17	97P2434600	BRKT S/BELT R	1	SUS304 T1.0
18	97P2625000	LEVER EVF GUIDE	1	ABS
19	97PA0859E-	EVF TOTAL AS	1	
20	97P1811300	DOOR AV JACK	1	ABS
21	97PA274100	RS KNOB AS	1	
22	97PA274000	BELT GRIP AS	1	
23	97P0102100	CABINET RIGHT	1	ABS
24	97P2507200	GUIDE ZOOM LEVER	1	ABS
25	97P2435800	BRKT LR FIX	1	SECC T0.8
26	97P2435700	BRKT IR R	1	SECC T0.8

1-5. CABINET (L) DISASSEMBLY



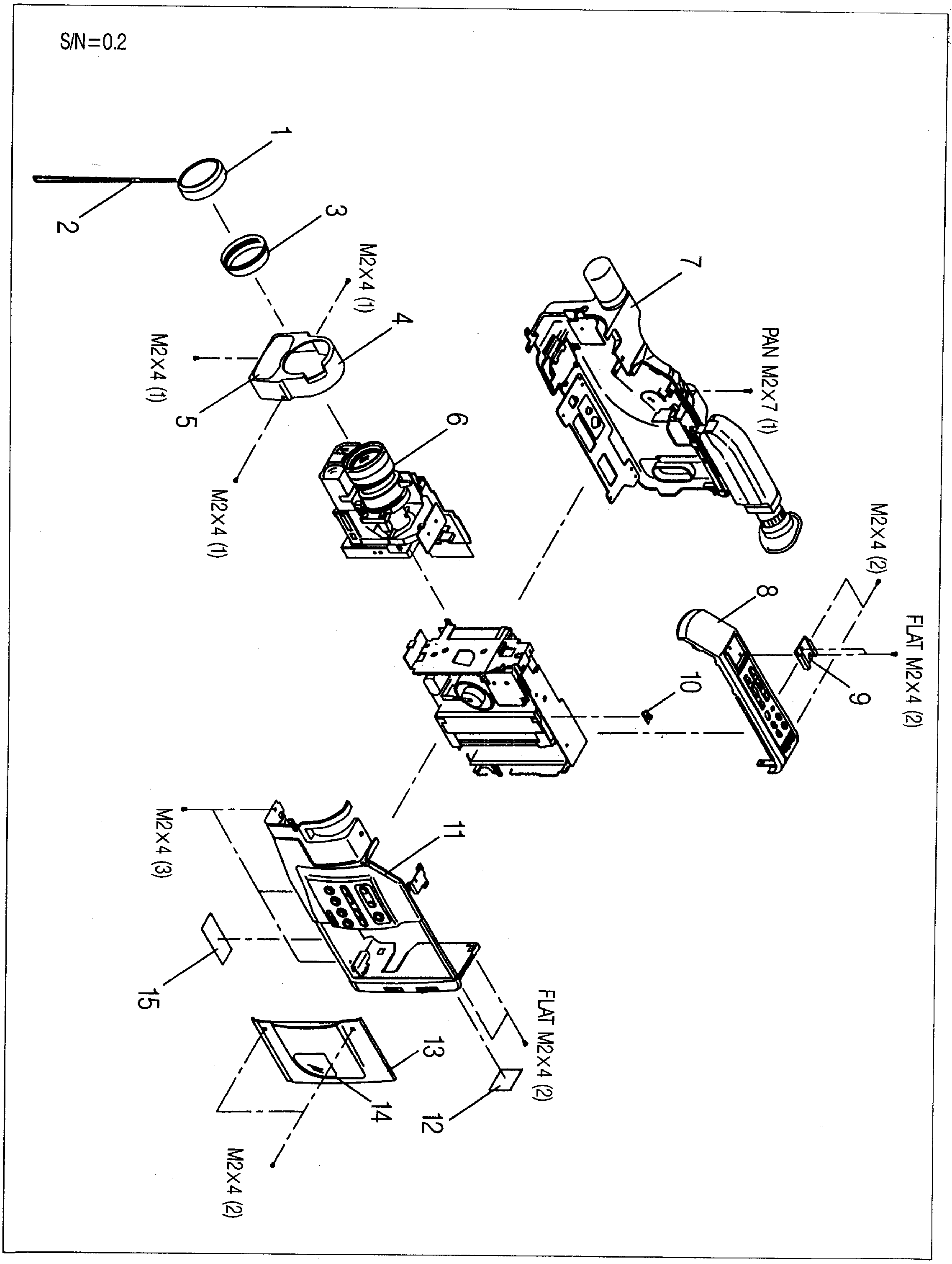
NO	PART CODE	PART NAME	Q'TY	DESCRIPTION
1	97P6538908	PCB CK-10	1	FR-10
2	97P1236000	KNOB AUTO/MANUAL	1	ABS
3	97P1325900	KNOB CAMERA KEY	1	ABS
4	97P3034500	SPRING BATT EJECT	1	SUS304 T0.2
5	97P2625200	LEVER BATT EJECT	1	POM
6	97P5201900	SLIDER BATT EJECT	1	POM
7	97P3034400	SPRING EJECT KNOB	1	SUS304
8	97P2326500	HOLDER SLIDER E/J	1	POM
9	97P1325600	KNOB EJECT	1	ABS
10	97P1325700	KNOB BATT EJECT	1	ABS
11	97P0102400	CABINET LEFT	1	ABS
12	97P2435400	BRKT IR L	1	SECC T0.8
13	97P1706700	INDICATOR LED	1	PMMA
14	97P6538913	PCB LD-10	1	FR-10
15	97P2434900	BRKT S/BELT L	1	SUS304 T1.0
16	97P2506900	SUPPORT SHOE BKT	1	SECC T1.0

1-6. CABINET TOP DISASSEMBLY



NO	PART CODE	PART NAME	Q'TY	DESCRIPTION
1	97P01012500	CABINET TOP	1	ABS
2	97P1326200	KNOB REC	1	ABS
3	97P1706600	INDICATOR REC	2	PMMA
4	97P1326100	KNOB VTR FUN	1	ABS
5	97P2435800	BRKT LR FIX	1	SECC T0.8
6	97P5202000	SLIDER P/KNOB	1	POM
7	97P3034600	SPG POWER KNOB	1	SUS304
8	97P1326300	KNOB POWER	1	ABS
9	97P2326800	HOLDER P/KNOB	1	ABS

1-7. SET MAIN DISASSEMBLY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M2×4 (1)
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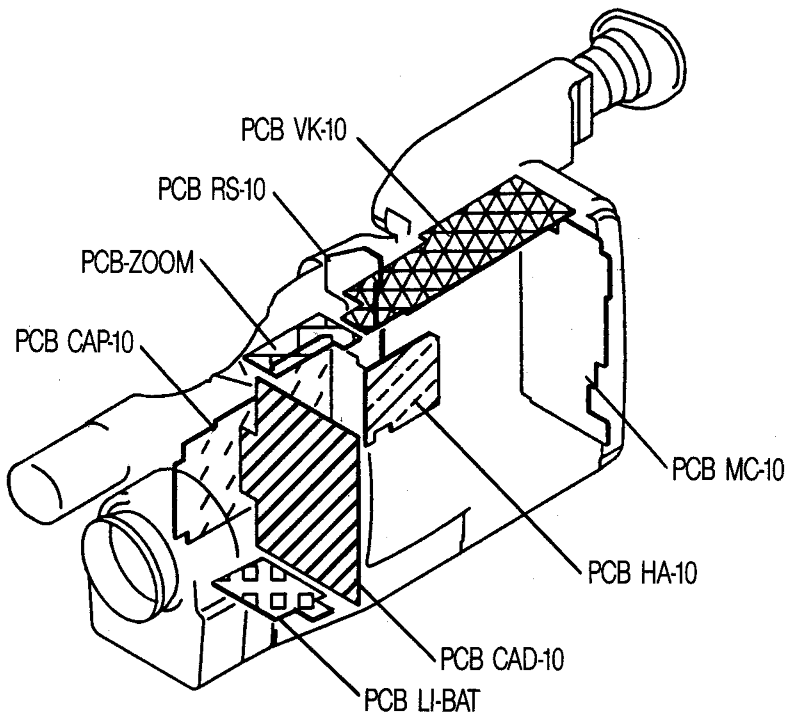
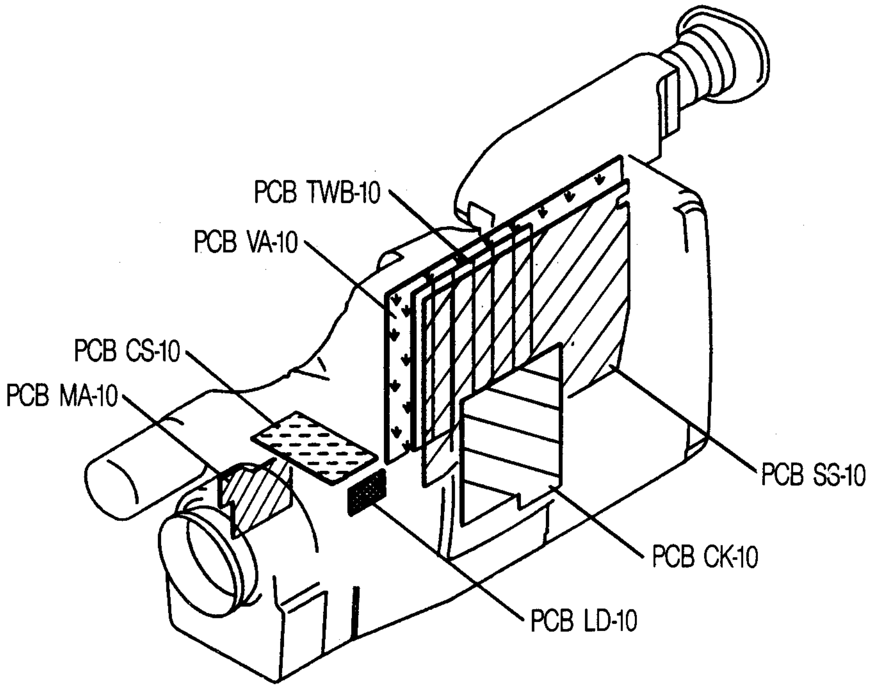
M2×4 (1)
5
M2×4 (1)
6
7
PAN M2×7 (1)
M2×4 (2)
8
FLAT M2×4 (2)
9
10
11
M2×4 (3)
15
13
14
12
FLAT M2×4 (2)
M2×4 (2)

NO	PART CODE	PART NAME	Q'TY	DESCRIPTION
1	97P0446200	CAP HOOD	1	ABS
2	97P30341000	WIRE CAP	1	NYLON
3	97P0447900	HOOD	1	ABS
4	97P0446300	CAP IR	1	ABS
5	97P4704400	FILTER IR	1	PMMA
6	97PA0859C-	CAMERA TOTAL AS	1	
7	97PB153100	RIGHT CABINET AS	1	
8	97PB153400	CABINET TOP AS	1	
9	97P2435000	BRKT SHOE	1	SPCC BLK
10	97P1326400	KNOB EDIT	1	ABS
11	97PB153300	LEFT CABINET AS	1	
12	97P9329500	LABEL LOCK BATT	1	YUPOJI T0.1
13	97P1811500	DOOR CASSETTE	1	ABS
14	97P1609500	WINDOW D/CST	1	PMMA
15	97P9337500	LABEL SPEC	1	PE FILM

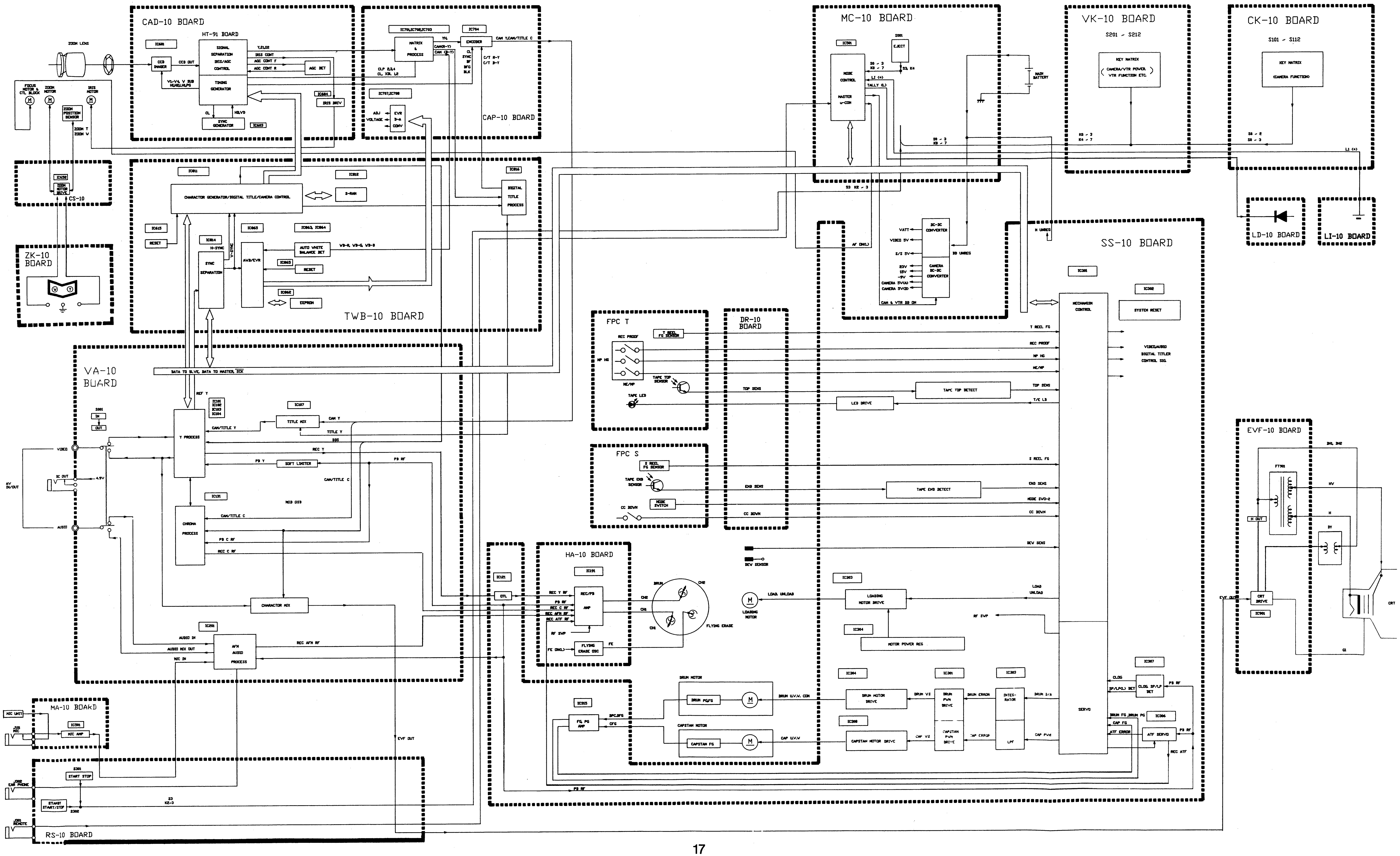
2. CIRCUIT BLOCK DIAGRAMS

2-1. PCB LOCATION

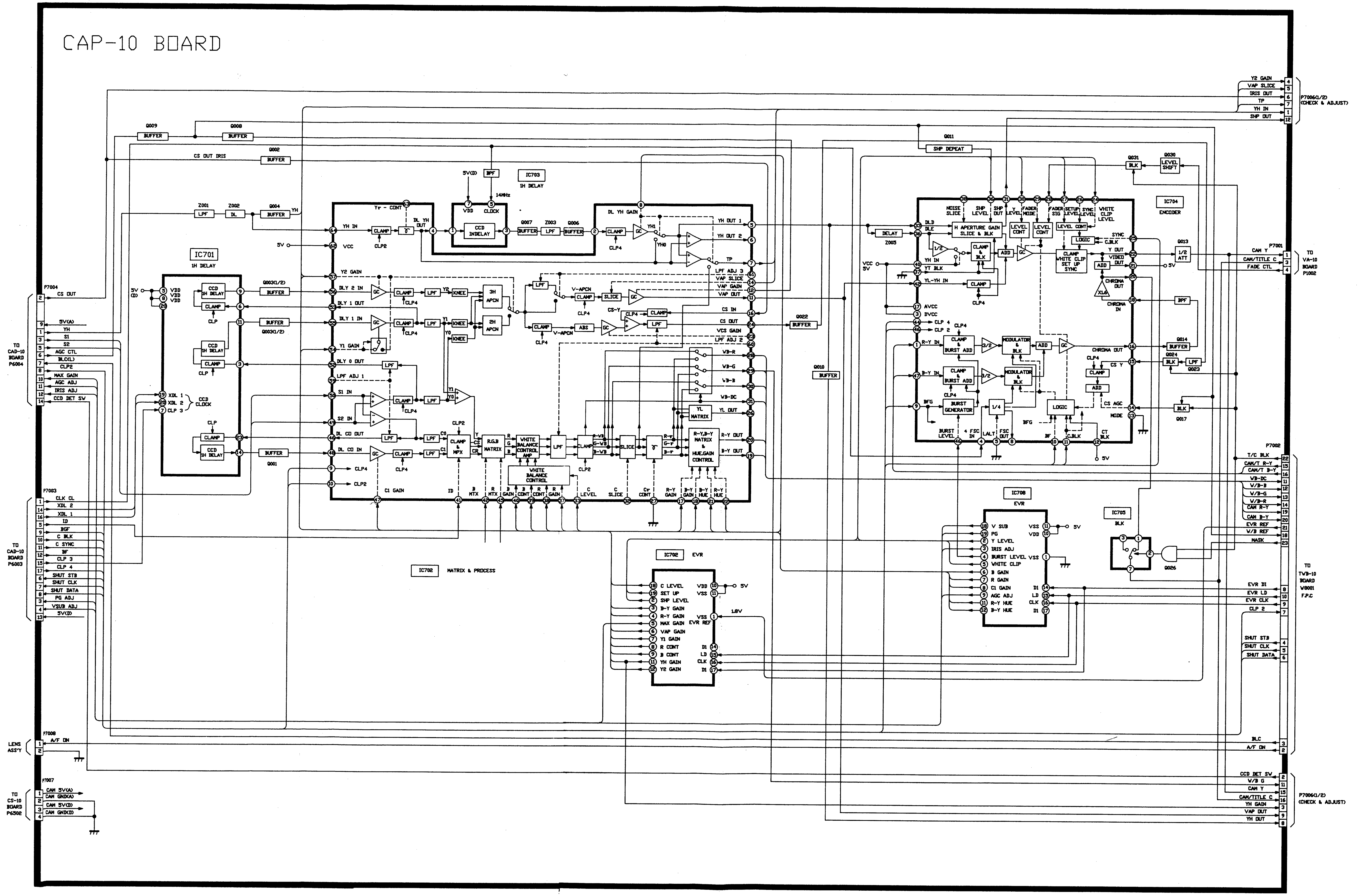

PCB VK-10
PCB RS-10
PCB-ZOOM
PCB CAP-10
PCB MC-10
PCB HA-10
PCB CAD-10
PCB LI-BAT


PCB TWB-10
PCB VA-10
PCB CS-10
PCB MA-10
PCB SG-10
PCB CK-10
PCB LD-10

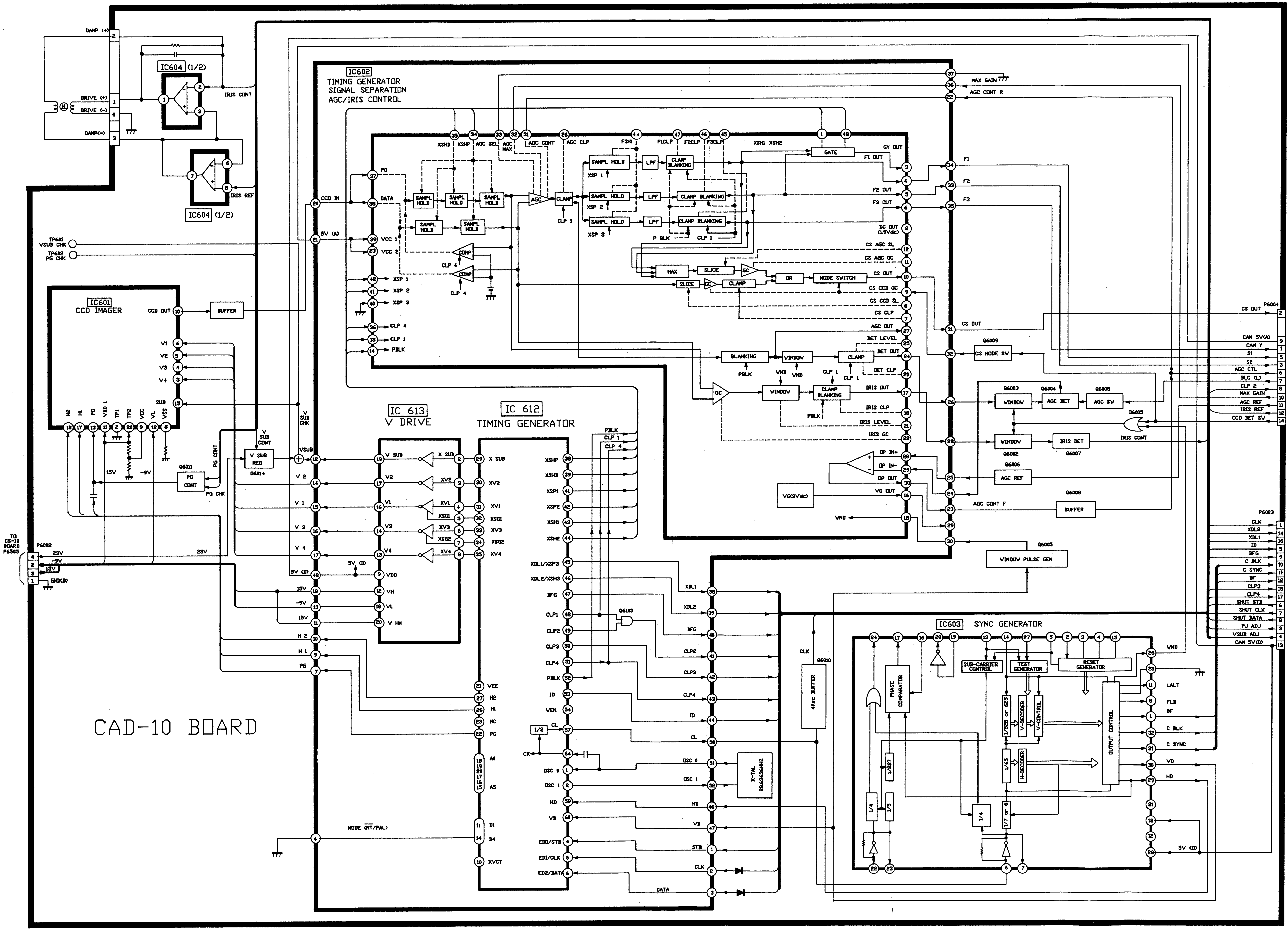
2-2. TOTAL BLOCK DIAGRAM


CAD-10 BOARD
HT-91 BOARD
ZOOM LENS
CCD IMAGER
CCD OUT
SIGNAL SEPARATION IRIS/AGC CONTROL
TIMING GENERATOR
SYNC GENERATOR
AGC DET
IRIS DRIV
FOCUS MOTOR & CTL BLOCK
ZOOM MOTOR
IRIS MOTOR
ZOOM POSITION SENSOR
CS-10
ZOOM MOTOR DRIVE
ZK-10 BOARD
MATRIX & PROCESS
ENCODER
CAM Y,CAM/TITLE C
C/T R-Y
C/T B-Y
EVR D-A CONV
CAP-10 BOARD
TWB-10 BOARD
CHARACTOR GENERATOR/DIGITAL TITLE/CAMERA CONTROL
S-RAM
DIGITAL TITLE PROCESS
RESET
SYNC SEPARATION
AWB/EVR
AUTO WHITE BALANCE DET
EXPROM
VA-10 BOARD
DATA TO SLVE, DATA TO MASTER, SCK
Y PROCESS
TITLE MIX
SOFT LIMITER
CHROMA PROCESS
CHARACTOR MIX
AFM AUDIO PROCESS
VIDEO
AUDIO
AV IN/OUT
MA-10 BOARD
MIC AMP
RS-10 BOARD
START STOP
EAR PHONE
REMOTE
EVF OUT
MC-10 BOARD
MODE CONTROL
MASTER u-CON
EJECT
MAIN BATTERY
DC-DC CONVERTER
CAMERA DC-DC CONVERTER
VK-10 BOARD
S201 - S212
KEY MATRIX
CAMERA/VTR POWER, VTR FUNCTION ETC.
CK-10 BOARD
S101 - S112
KEY MATRIX (CAMERA FUNCTION)
LD-10 BOARD
LI-10 BOARD
SS-10 BOARD
MECHANISM CONTROL
SYSTEM RESET
VIDEO/AUDIO DIGITAL TITLER CONTROL SIG.
FPC T
T REEL FG SENSOR
REC PROOF
TAPE TOP SENSOR
TAPE LED
FPC S
S REEL FG SENSOR
TAPE END SENSOR
MODE SWITCH
CC DOWN
DR-10 BOARD
TAPE TOP DETECT
LED DRIVE
TAPE END DETECT
DEV SENSOR
HA-10 BOARD
REC/PB AMP
FLYING ERASE OSC
DTL
DRUM
FLYING ERASE
LOADING MOTOR
LOADING MOTOR DRIVE
MOTOR POWER REG
DRUM MOTOR
DRUM PG/FG
CAPSTAN MOTOR
CAPSTAN FG
FG, PG AMP
DRUM MOTOR DRIVE
DRUM PWM DRIVE
CAPSTAN PWM DRIVE
CAPSTAN MOTOR DRIVE
INTEGRATOR
LPF
SERVO
CLOG, SP/LP DET
ATF SERVO
PB RF
EVF-10 BOARD
FBT
CRT DRIVE
CRT

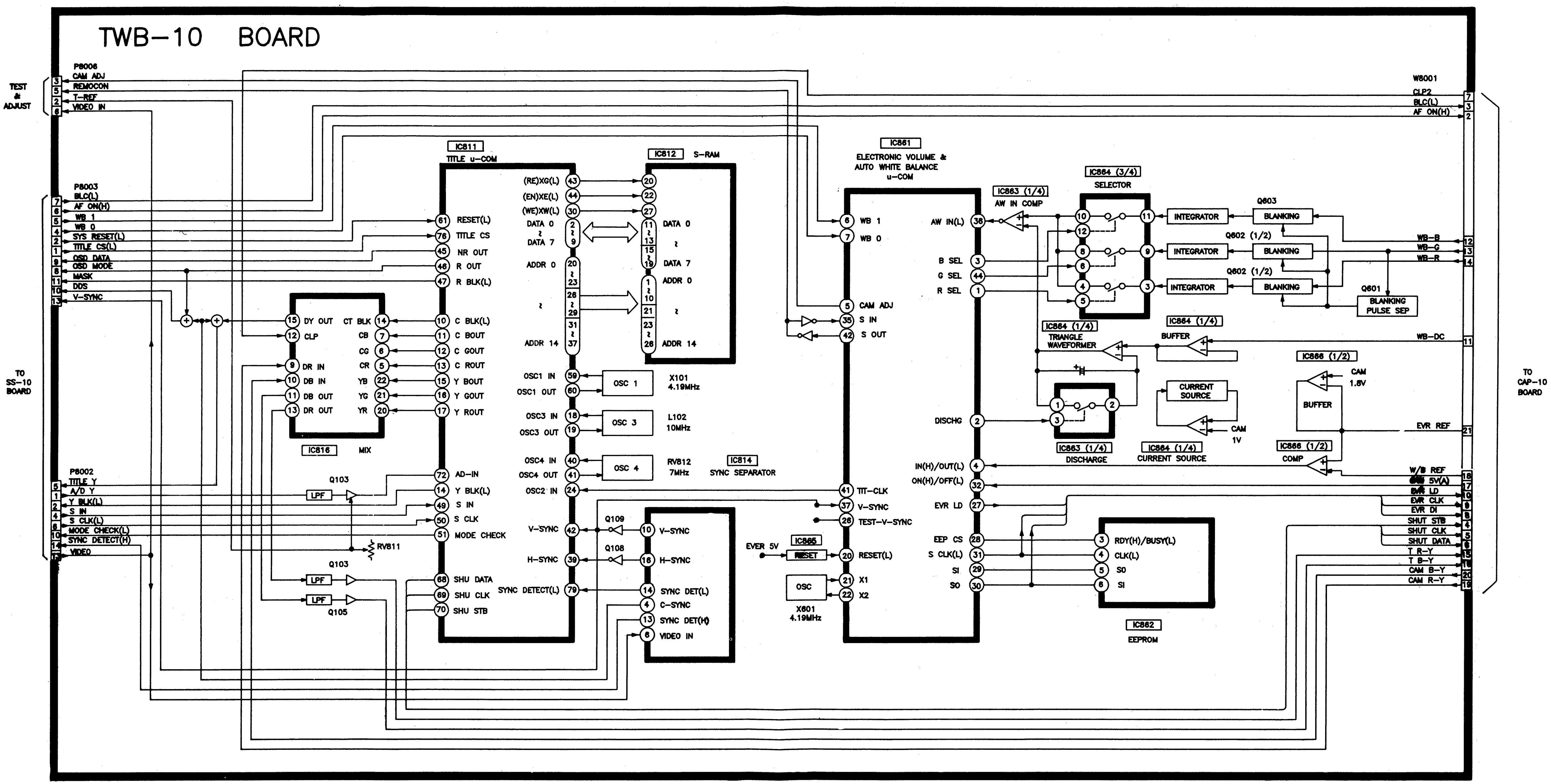
3. CAMERA BLOCK DIAGRAM (CAP-10BD)


CAP-10 BOARD
IC701
1H DELAY
IC703
1H DELAY
IC702 MATRIX & PROCESS
IC702 EVR
IC704
ENCODER
IC708
EVR
IC705
BLK
Q009 BUFFER
Q008 BUFFER
Q002 BUFFER
CS OUT IRIS
Z001 LPF
Z002 DL
Q004 BUFFER
Q007 BUFFER
Z003 LPF
Q006 BUFFER
CCD 1H DELAY
CLAMP
CCD INDELAY
WHITE BALANCE CONTROL AMP
WHITE BALANCE CONTROL
R.G.B MATRIX
R-Y,B-Y MATRIX & HUE.GAIN CONTROL
YL MATRIX
Q011 SHP DEPEAT
Q031 BLK
Q030 LEVEL SHIFT
Q013 1/2 ATT
Q014 BUFFER
Q024 BLK
Q023 LPF
Q017 BLK
Q022 BUFFER
Q010 BUFFER
Q001 BUFFER
Q026
DELAY Z005
H APERTURE GAIN SLICE & BLK
MODULATOR & BLK
BURST GENERATOR
CLAMP WHITE CLIP SET UP SYNC
LOGIC
P7004
TO CAD-10 BOARD P6004
P7003
TO CAD-10 BOARD P6003
P7008
LENS ASS'Y
A/F ON
P7007
TO CS-10 BOARD P6502
CAM 5V(A)
CAM GND(A)
CAM 5V(D)
CAM GND(D)
P7006(1/2) (CHECK & ADJUST)
Y2 GAIN
VAP SLICE
IRIS OUT
TP
YH IN
SHP OUT
P7001
TO VA-10 BOARD P1002
CAM Y
CAM/TITLE C
FADE CTL
P7002
TO TVB-10 BOARD W8001 F.P.C
T/C BLK
CAM/T R-Y
CAM/T B-Y
WB-DC
EVR REF
W/B REF
MASK
EVR D1
EVR LD
EVR CLK
CLP 2
SHUT STB
SHUT CLK
SHUT DATA
BLC
CCD DET SW
W/B G
YH GAIN
VAP OUT
YH OUT
CS OUT
CLK CL
XDL 1
XDL 2
ID
BGF
C BLK
C SYNC
BF
CLP 3
CLP 4
AGC CTL
MAX GAIN
AGC ADJ
IRIS ADJ
PG ADJ
VSUB ADJ
5V(D)
5V(A)
14MHz

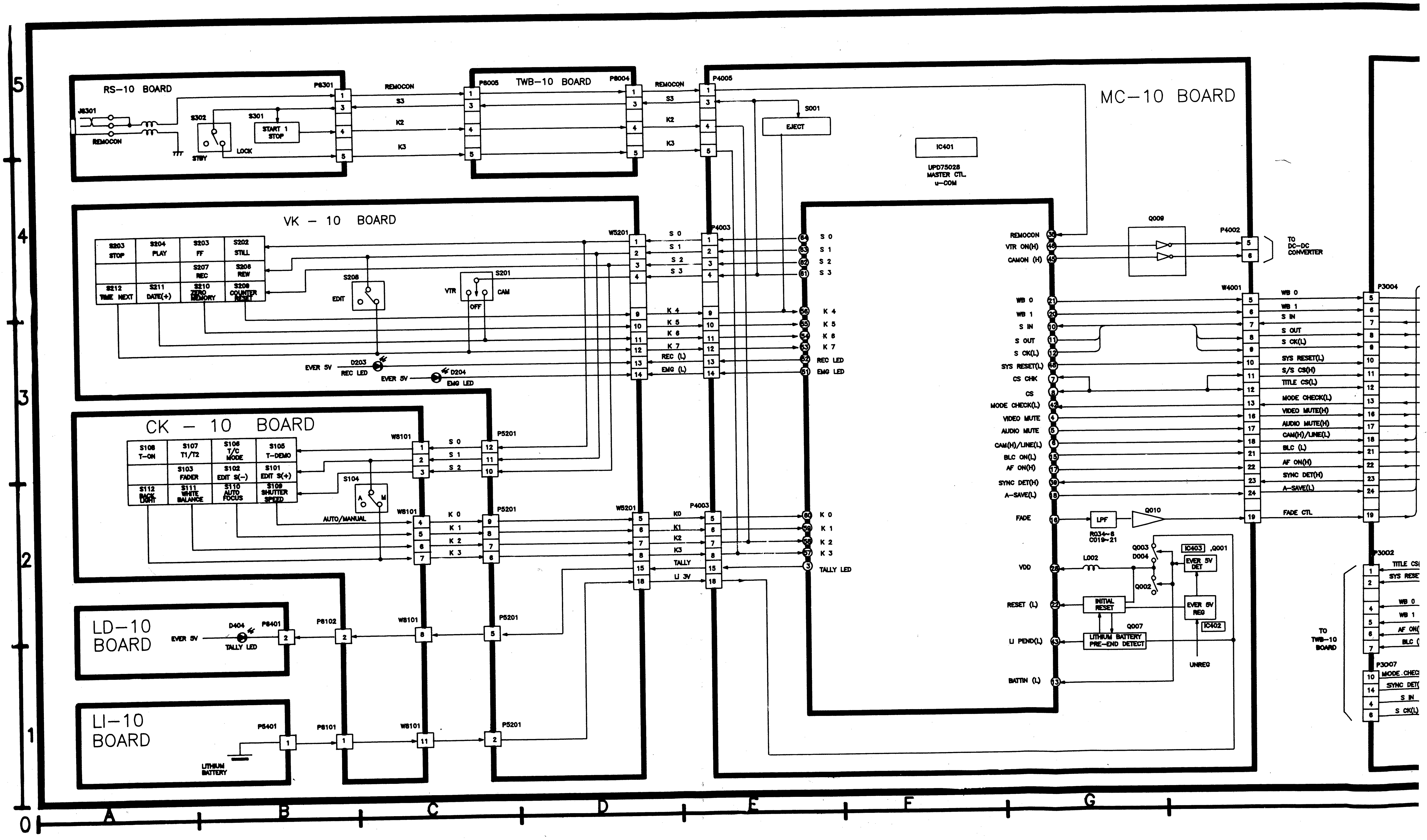
2-4. CAMERA BLOCK DIAGRAM (CAD-10BD)


IC604 (1/2)
IRIS CONT
IRIS REF
DAMP (+)
DRIVE (+)
DRIVE (-)
DAMP(-)
TP601 VSUB CHK
TP602 PG CHK
IC601 CCD IMAGER
CCD OUT
BUFFER
V1
V2
V3
V4
SUB
H2
H1
PG
VDD
TP1
VCC
VL
VSS
15V
-9V
Q6011
PG CONT
PG CHK
V SUB REG
Q6014
V SUB CONT
V SUB CHK
TO CS-10 BOARD P6505
P6002
23V
-9V
15V
GND(D)
IC602 TIMING GENERATOR SIGNAL SEPARATION AGC/IRIS CONTROL
CCD IN
5V (A)
DATA
VCC 1
VCC 2
XSP 1
XSP 2
XSP 3
CLP 4
CLP 1
PBLK
XSHD
XSHP
AGC SEL
AGC MAX
AGC CONT
AGC CLP
FSH1
F1CLP
F2CLP
F3CLP
XSH1
XSH2
SAMPL HOLD
AGC
CLAMP
LPF
CLAMP BLANKING
GATE
COMP
MAX
SLICE
GC
OR
MODE SWITCH
BLANKING
WINDOW
GY OUT
F1 OUT
F2 OUT
F3 OUT
DC OUT (1.5Vdc)
CS AGC SL
CS AGC GC
CS OUT
CS CCD GC
CS CCD SL
CS CLP
AGC OUT
DET LEVEL
DET OUT
DET CLP
IRIS OUT
IRIS CLP
IRIS LEVEL
IRIS GC
OP IN+
OP IN-
OP OUT
VG OUT
VG(3Vdc)
WND
MAX GAIN
AGC CONT R
F1
F2
F3
CS OUT
Q6009
CS MODE SW
Q6003
Q6004
Q6005
AGC DET
AGC SW
D6005
Q6002
Q6007
IRIS DET
IRIS CONT
Q6006
AGC REF
Q6008
BUFFER
AGC CONT F
WINDOW PULSE GEN
P6004
CAM 5V(A)
CAM Y
S1
S2
AGC CTL
BLC (L)
CLP 2
MAX GAIN
AGC REF
IRIS REF
CCD DET SW
TO CAP-10 BOARD (P7004)
P6003
CLK
XDL2
XDL1
ID
BFG
C BLK
C SYNC
BF
CLP3
CLP4
SHUT STB
SHUT CLK
SHUT DATA
PJ ADJ
VSUB ADJ
CAM 5V(D)
TO CAP-10 BOARD (P7003)
IC 613 V DRIVE
V SUB
X SUB
XV2
XV1
XSG1
XV3
XSG2
XV4
VDD
VH
VL
V HH
5V (D)
IC 612 TIMING GENERATOR
XSHP
XSHD
XSP1
XSP2
XSH1
XSH2
XDL1/XSP3
XDL2/XSH3
BFG
CLP1
CLP2
CLP3
CLP4
PBLK
ID
VEN
CL
1/2
CX
OSC 0
OSC 1
HD
VD
EDO/STB
EDI/CLK
EDI/DATA
VEE
H2
H1
NC
PG
A0
A5
D1
D4
XVCT
MODE (NT/PAL)
Q6103
X-TAL 28.63636MHz
STB
DATA
CLK
Q6010
4fsc BUFFER
IC603 SYNC GENERATOR
SUB-CARRIER CONTROL
TEST GENERATOR
RESET GENERATOR
PHASE COMPARATOR
1/525 or 625
V-DECODER
V-CONTROL
1/227
1/65
H-DECODER
OUTPUT CONTROL
1/4
1/5
1/7 or 6
LALT
FLD
C BLK
C SYNC
VD
HD
5V (D)
CAD-10 BOARD

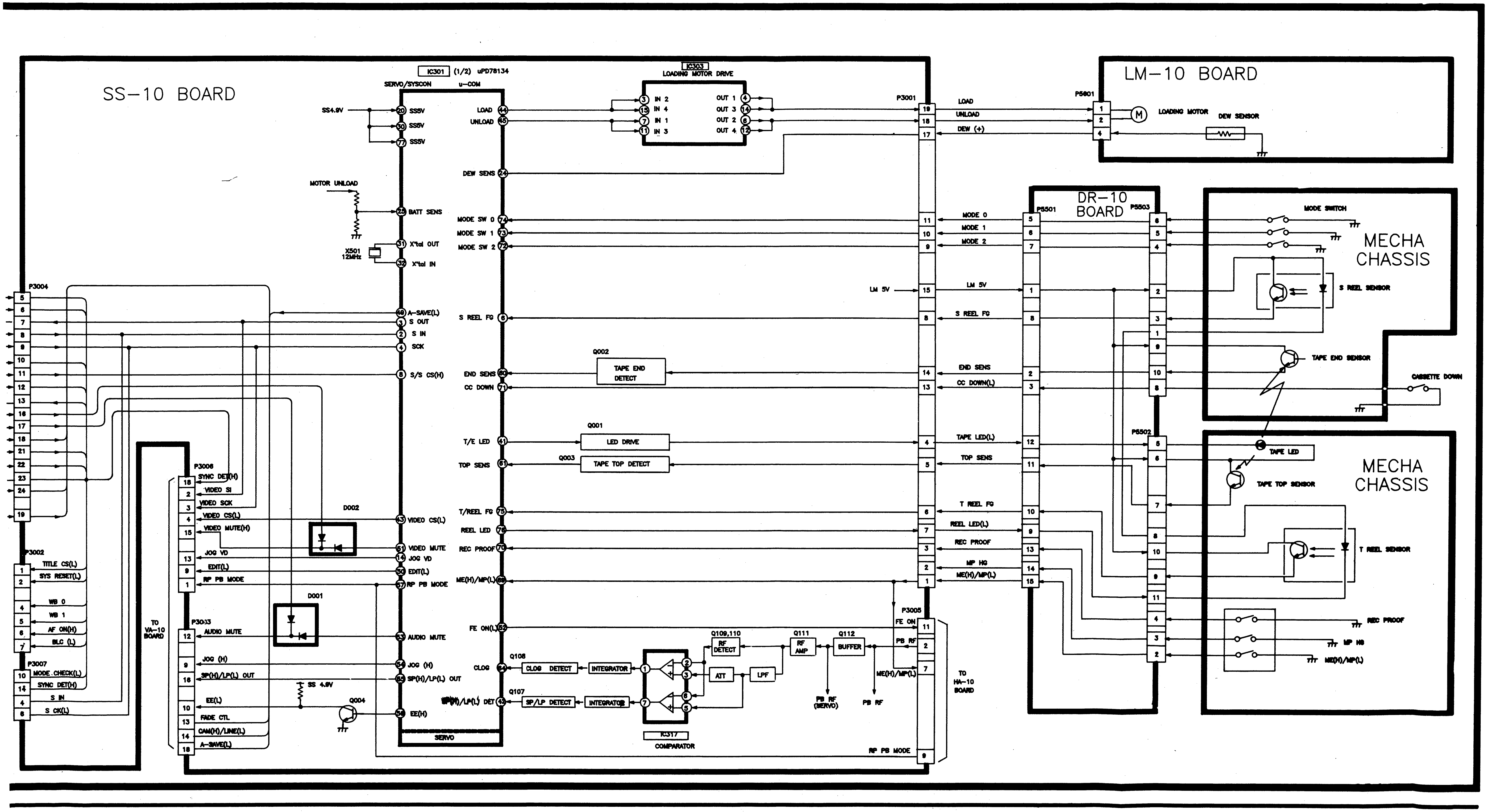
2-5. TITLE AND AUTO WHITE BALANCE BLOCK DIAGRAM


TWB-10 BOARD
TEST & ADJUST
P8006
3 CAM ADJ
5 REMOCON
2 T-REF
6 VIDEO IN
TO SS-10 BOARD
P8003
7 BLC(L)
6 AF ON(H)
5 WB 1
4 WB 0
2 SYS RESET(L)
1 TITLE CS(L)
9 OSD DATA
8 OSD MODE
11 MASK
10 DDS
13 V-SYNC
P8002
5 TITLE Y
1 A/D Y
2 Y BLK(L)
4 S IN
6 S CLK(L)
10 MODE CHECK(L)
14 SYNC DETECT(H)
12 VIDEO
IC816
MIX
15 DY OUT
12 CLP
9 DR IN
10 DB IN
11 DB OUT
13 DR OUT
CT BLK 14
CB 7
CG 6
CR 5
YB 22
YG 21
YR 20
Q103
LPF
RV811
Q103
LPF
LPF
Q105
IC811
TITLE u-COM
61 RESET(L)
76 TITLE CS
45 NR OUT
46 R OUT
47 R BLK(L)
10 C BLK(L)
11 C BOUT
12 C GOUT
13 C ROUT
15 Y BOUT
16 Y GOUT
17 Y ROUT
72 AD-IN
14 Y BLK(L)
49 S IN
50 S CLK
51 MODE CHECK
68 SHU DATA
69 SHU CLK
70 SHU STB
(RE)XG(L) 43
(EN)XE(L) 44
(WE)XW(L) 30
DATA 0 ~ DATA 7 2 ~ 9
ADDR 0 20 ~ 23
26 ~ 29
ADDR 14 31 ~ 37
OSC1 IN 59
OSC1 OUT 60
OSC3 IN 18
OSC3 OUT 19
OSC4 IN 40
OSC4 OUT 41
OSC2 IN 24
V-SYNC 42
H-SYNC 39
SYNC DETECT(L) 79
IC812
S-RAM
20
22
27
11 ~ 13 DATA 0
15 ~ 19 DATA 7
1 ~ 10 ADDR 0
21
23 ~ 26 ADDR 14
OSC 1
X101
4.19MHz
OSC 3
L102
10MHz
OSC 4
RV812
7MHz
IC814
SYNC SEPARATOR
Q109
Q108
10 V-SYNC
16 H-SYNC
14 SYNC DET(L)
4 C-SYNC
13 SYNC DET(H)
6 VIDEO IN
IC861
ELECTRONIC VOLUME & AUTO WHITE BALANCE u-COM
6 WB 1
7 WB 0
5 CAM ADJ
35 S IN
42 S OUT
41 TIT-CLK
37 V-SYNC
26 TEST-V-SYNC
20 RESET(L)
21 X1
22 X2
AW IN(L) 38
B SEL 3
G SEL 44
R SEL 1
DISCHG 2
IN(H)/OUT(L) 4
ON(H)/OFF(L) 32
EVR LD 27
EEP CS 28
S CLK(L) 31
SI 29
SO 30
EVER 5V
IC865
RESET
OSC
X601
4.19MHz
IC863 (1/4)
AW IN COMP
IC864 (3/4)
SELECTOR
10
12
8
6
4
5
11
9
3
INTEGRATOR
INTEGRATOR
INTEGRATOR
Q603
BLANKING
Q602 (1/2)
BLANKING
Q602 (1/2)
BLANKING
Q601
BLANKING PULSE SEP
IC864 (1/4)
TRIANGLE WAVEFORMER
IC864 (1/4)
BUFFER
IC863 (1/4)
DISCHARGE
1
2
3
CURRENT SOURCE
CAM 1V
IC864 (1/4)
CURRENT SOURCE
IC866 (1/2)
BUFFER
CAM 1.8V
IC866 (1/2)
COMP
IC862
EEPROM
3 RDY(H)/BUSY(L)
4 CLK(L)
5 SO
6 SI
W8001
CLP2 7
BLC(L) 3
AF ON(H) 2
WB-B 12
WB-G 13
WB-R 14
WB-DC 11
EVR REF 21
W/B REF 18
5V(A) 17
EVR LD 10
EVR CLK 9
EVR DI 8
SHUT STB 4
SHUT CLK 5
SHUT DATA 6
T R-Y 15
T B-Y 16
CAM B-Y 20
CAM R-Y 19
TO CAP-10 BOARD

2-6. SYSTEM CONTROL BLOCK DIAGRAM



RS-10 BOARD
J8301
REMOCON
S302
S301
START 1 STOP
STBY
LOCK
P8301
REMOCON
S3
K2
K3
TWB-10 BOARD
P8005
P8004
REMOCON
S3
K2
K3
P4005
S001
EJECT
MC-10 BOARD
IC401
UPD75028 MASTER CTL. u-COM
VK - 10 BOARD
S203 STOP
S204 PLAY
S203 FF
S202 STILL
S207 REC
S208 REW
S212 TIME NEXT
S211 DATE(+)
S210 ZERO MEMORY
S209 COUNTER RESET
S208
EDIT
S201
VTR
CAM
OFF
W5201
P4003
S 0
S 1
S 2
S 3
K 4
K 5
K 6
K 7
REC (L)
EMG (L)
EVER 5V
D203
REC LED
EVER 5V
D204
EMG LED
REC LED
EMG LED
CK - 10 BOARD
W8101
S108 T-ON
S107 T1/T2
S106 T/C MODE
S105 T-DEMO
S103 FADER
S102 EDIT S(-)
S101 EDIT S(+)
S112 BACK LIGHT
S111 WHITE BALANCE
S110 AUTO FOCUS
S109 SHUTTER SPEED
S104
AUTO/MANUAL
P5201
K 0
K 1
K 2
K 3
K0
K1
K2
K3
TALLY
LI 3V
TALLY LED
LD-10 BOARD
EVER 5V
D404
TALLY LED
P8401
P8102
LI-10 BOARD
P5401
P8101
LITHIUM BATTERY
REMOCON
VTR ON(H)
CAMON (H)
Q009
P4002
TO DC-DC CONVERTER
WB 0
WB 1
S IN
S OUT
S CK(L)
SYS RESET(L)
CS CHK
CS
MODE CHECK(L)
VIDEO MUTE
AUDIO MUTE
CAM(H)/LINE(L)
BLC ON(L)
AF ON(H)
SYNC DET(H)
A-SAVE(L)
FADE
LPF
R034~6 C019~21
Q010
VDD
L002
Q003
D004
Q002
IC403
Q001
EVER 5V DET
RESET (L)
INITIAL RESET
EVER 5V REG
IC402
Q007
LITHIUM BATTERY PRE-END DETECT
LI PEND(L)
UNREG
BATTIN (L)
W4001
WB 0
WB 1
S IN
S OUT
S CK(L)
SYS RESET(L)
S/S CS(H)
TITLE CS(L)
MODE CHECK(L)
VIDEO MUTE(H)
AUDIO MUTE(H)
CAM(H)/LINE(L)
BLC (L)
AF ON(H)
SYNC DET(H)
A-SAVE(L)
FADE CTL
P3004
P3002
TITLE CS
SYS RESE
WB 0
WB 1
AF ON
BLC
TO TWB-10 BOARD
P3007
MODE CHEC
SYNC DET
S IN
S CK(L)
0
1
2
3
4
5
A
B
C
D
E
F
G


SS-10 BOARD
IC301 (1/2) uPD78134
SERVO/SYSCON u-COM
IC303 LOADING MOTOR DRIVE
IN 2
IN 4
IN 1
IN 3
OUT 1
OUT 3
OUT 2
OUT 4
SS4.9V
SS5V
LOAD
UNLOAD
DEW SENS
MOTOR UNLOAD
BATT SENS
X501 12MHz
X'tal OUT
X'tal IN
MODE SW 0
MODE SW 1
MODE SW 2
A-SAVE(L)
S OUT
S IN
SCK
S REEL FG
S/S CS(H)
Q002
TAPE END DETECT
END SENS
CC DOWN
Q001
LED DRIVE
T/E LED
Q003
TAPE TOP DETECT
TOP SENS
T/REEL FG
REEL LED
REC PROOF
ME(H)/MP(L)
D002
VIDEO CS(L)
VIDEO MUTE
JOG VD
EDIT(L)
RP PB MODE
D001
AUDIO MUTE
FE ON(L)
Q108
CLOG
CLOG DETECT
INTEGRATOR
JOG (H)
SP(H)/LP(L) OUT
SS 4.9V
Q004
EE(H)
Q107
SP(H)/LP(L) DET
SP/LP DETECT
INTEGRATOR
SERVO
IC317
COMPARATOR
Q109,110
RF DETECT
ATT
LPF
Q111
RF AMP
Q112
BUFFER
PB RF (SERVO)
PB RF
ME(H)/MP(L)
P3004
P3002
TITLE CS(L)
SYS RESET(L)
WB 0
WB 1
AF ON(H)
BLC (L)
P3007
MODE CHECK(L)
SYNC DET(H)
S IN
S CK(L)
TO VA-10 BOARD
P3006
SYNC DET(H)
VIDEO SI
VIDEO SCK
VIDEO CS(L)
VIDEO MUTE(H)
JOG VD
EDIT(L)
RP PB MODE
P3033
AUDIO MUTE
JOG (H)
SP(H)/LP(L) OUT
EE(L)
FADE CTL
CAM(H)/LINE(L)
A-SAVE(L)
P3001
LOAD
UNLOAD
DEW (+)
MODE 0
MODE 1
MODE 2
LM 5V
S REEL FG
END SENS
CC DOWN(L)
TAPE LED(L)
TOP SENS
T REEL FG
REEL LED(L)
REC PROOF
MP HG
ME(H)/MP(L)
P3005
FE ON
PB RF
ME(H)/MP(L)
RP PB MODE
TO HA-10 BOARD
LM-10 BOARD
P5601
LOADING MOTOR
M
DEW SENSOR
DR-10 BOARD
P5501
P5503
P5502
MECHA CHASSIS
MODE SWITCH
S REEL SENSOR
TAPE END SENSOR
CASSETTE DOWN
MECHA CHASSIS
TAPE LED
TAPE TOP SENSOR
T REEL SENSOR
REC PROOF
MP HG
ME(H)/MP(L)

2-6-1. System Control Section Function Description

The System Control Section consists of following three microcomputers

- Servo/Syscon Control microcomputer μPD78134
- Master Control microcomputer μPD75028
- EVR/AWB Control microcomputer μPD75006

2-6-1-1. Servo/Syscon Control microcomputer μPD78134

1-1) Function description

1) Power ON/OFF Control
2) Servo Control
3) Execution of various modes.
4) Loading motor control
5) H.M.S. Counter
6) JOG VD insertion
7) Error detection.
   Battery end/pre-end
   Tape end
   No cassette
   Erase prevention
   DEW (condensation)
   PAUSE release
   CLOG (head clog)
   L. MOTOR ENERGENCY
   Drum rotation
   Drum phase
   Reel rotation
   Capstan rotation
   Drum/Capstan start

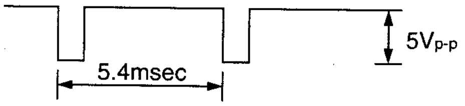
1-2) Abbreviated Specifications

1) 8 bit high-speed, highly integrated single chip microcomputer
2) A/D Converter, 8bit 8 channel
3) Timer/Counter
4) Vector interrupt
5) Real-time output function
6) PWM output, 12bit, 2 channel
7) High precision measurement function for servo
8) Serial interface
9) Stand-by function
10) External memory expansion mode, microprocessor mode.
11) ROM: 16K bytes
12) RAM: 384 bytes
13) Speed: 333 nsec.
14) General register: 8bits×8×4 banks
15) Process: CMOS
16) Package: 80pin flat package

2-6-1-2. Servo, System Control System Terminal Function Description (SS-10BD IC301 μPD78134)

Pin No.	Signal Name	I/O	Connection	Function
1	Drum PG	I	IC315 ⑦	Drum PG input terminal
2	S IN	I	P3004 ⑧	Serial Data Input terminal
3	S OUT	O	P3004 ⑦ (To Master) P3006 ② (To Video)	Serial Data Output terminal
4	S CLK	I	P3004 ⑨	Serial Clock input terminal
5	NC			
6	S-Reel FG	I	P3001 ⑧	Supply Reel FG input
7	N.C			
8	S/S CS	I	P3004 ⑪	Select signal of this microcomputer from internal bus communication master controller selected with "L"
9	C FG	I	IC315 ⑩	Capstan FG input terminal
0	D FG	I	IC315 ③	Drum FG input terminal
11	NC			
12	V Sync	I	P3002 ⑬ (TWB BD)	V SYNC. Signal input terminal
13	RF SWP	O	Head AMP Video circuit	RF Switching Pulse Output terminal
14	QV Sync	O	P3006 ⑬	Artificial VD output terminal input to VIDEO signal in varying speed playback
15 16	NC			
17	D PWM	O		PWM output terminal for DRUM ERROR output, Servo exclusive output terminal. (PWM mode)
18	C PWM	O		PWM output terminal for CAP ERROR output, Servo exclusive output terminal (PWM mode)
19	AV$_{SS}$		GND	
20	AV$_{REF}$	I	S/S 5V	
21	ATF ERROR	I	IC316 ⑫	ATF Error Input (A/D terminal)
22	SW ADJ	I	RV302	Switching position adjustment input (A/D terminal)
23	QV ADJ	I	RV301	Fine Still position adjustment input (A/D terminal)
24	DEW	I	P3001 ⑰	DEW SENSOR input (A/D terminal)
25	Battery SENS	I	UNREG 7.5V	Battery input voltage sense (A/D terminal)
26 27 28	NC NC NC		GND	
29	Reset (L)	I	IC302 ①	Reset by "L"
30	V$_{DD}$		S/S 5V	5V

<table>
<tr><th>Pin No.</th><th>Signal Name</th><th>I/O</th><th>Connection</th><th>Function</th></tr>
<tr><td>31
32</td><td>X2
X1</td><td>I</td><td></td><td>Crystal connecting pin for system clock oscillation
Oscillation at: 12 MHz</td></tr>
<tr><td>33</td><td>Vss</td><td></td><td>GND</td><td></td></tr>
<tr><td>34</td><td>Drum Brake</td><td>O</td><td>IC314 ⑪</td><td>Not used.</td></tr>
<tr><td>35</td><td>Drum FWD (L)</td><td>O</td><td>IC314 ③</td><td>Drum rotation direction control signal.
RVS by "H", FWD by "L"</td></tr>
<tr><td>36</td><td>Drum ON</td><td>O</td><td>IC314 ⑦</td><td>Drum driver ON control signal.
Drum ON by "H"</td></tr>
<tr><td>37</td><td>Cap ON</td><td>O</td><td>IC318 ⑬</td><td>Capstan driver ON control signal.
Capstan ON by "H"</td></tr>
<tr><td>38</td><td>Cap FWD</td><td>O</td><td>IC318 ⑳</td><td>Capstan rotation direction control signal FWD by "H", RVS by "L"</td></tr>
<tr><td>39</td><td>Cap ERH</td><td>O</td><td></td><td>Not used</td></tr>
<tr><td>40</td><td>Drum ACCEL (L)</td><td>O</td><td>Q009 Ⓑ</td><td>Drum motor accelation signal ACCEL by "L"</td></tr>
<tr><td>41</td><td>T/E LED</td><td>O</td><td>Q001 Ⓑ</td><td>Tape Top/END LED driving signal</td></tr>
<tr><td>42</td><td>SP/LP DET.</td><td>I</td><td>Q107 Ⓒ</td><td>SP/LP recognition signal input SP by "H" LP by "L"</td></tr>
<tr><td>43</td><td>Video CS</td><td>O</td><td>P3006 ④</td><td>Selecting signal to video IC of internal bus signal.
Select by "L"</td></tr>
<tr><td>44
45</td><td>LD
UNLD</td><td>O
O</td><td>IC303 ③, ⑮
IC303 ⑦, ⑪</td><td>Loading Motor Control Signals
<table>
<tr><th>Conditions / Signals</th><th>Off</th><th>Load</th><th>UNLD</th><th>Brake</th></tr>
<tr><td>LOAD</td><td>L</td><td>H</td><td>L</td><td>H</td></tr>
<tr><td>UNLOAD</td><td>L</td><td>L</td><td>H</td><td>H</td></tr>
</table></td></tr>
<tr><td>46
47
48</td><td>NC
NC
NC</td><td></td><td></td><td></td></tr>
<tr><td>49</td><td>A-SAVE</td><td>O</td><td>Not used</td><td></td></tr>
<tr><td>50</td><td>EDIT (L)</td><td>O</td><td>P3006 ⑨</td><td>EDIT ON/OFF Control
EDIT is selected with "L" and inter locked with EDIT key.</td></tr>
<tr><td>51</td><td>Video Mute</td><td>O</td><td>P3006 ⑮</td><td>Video Mute Output signal
Video mute is selected with "H"</td></tr>
<tr><td>52</td><td>FE ON (L)</td><td>O</td><td>P3005 ⑪</td><td>Flying Erase Oscillation On/Off control signal
Oscillation is selected with "L"</td></tr>
<tr><td>53</td><td>Audio Mute</td><td>O</td><td>P3003 ⑫</td><td>Audio Mute output signal
Audio Mute is selected with "H"</td></tr>
<tr><td>54</td><td>JOG</td><td>O</td><td>P3003 ⑨</td><td>Normal/JOG Mode recognition signal: JOG is selected with "H"</td></tr>
<tr><td>55</td><td>SP/LP OUT</td><td>O</td><td>P3003 ⑯</td><td>SP/LP Mode recognition signal
SP mode is selected with "H"</td></tr>
<tr><td>56</td><td>EE (H)</td><td>O</td><td>Q004 Ⓑ</td><td>Video/Audio system REC/PB Mode Select.
PB mode is selected with "L"</td></tr>
</table>

<table>
<tr><th>Pin No.</th><th>Signal Name</th><th>I/O</th><th>Connection</th><th>Function</th></tr>
<tr><td>57</td><td>RP PB Mode</td><td>O</td><td>IC316 (ATF) ㉕
P3005 ⑨
P3006 ①</td><td>REC/PB mode select signal of RP amplifier and ATF IC</td></tr>
<tr><td>58
59</td><td>TEST 1
TEST 2</td><td>I
I</td><td></td><td>TEST 1 Mode: Shift Track Mode recognition input terminal.
TEST 2 Mode: Emergency Open Mode recognition input terminal: TEST MODE is selected with "L"</td></tr>
<tr><td>60
61</td><td>END SENSOR
TOP SENSOR</td><td>I</td><td>Q002 Ⓒ
Q003 Ⓒ</td><td>Tape TOP/END sensor input
* TOP/END SENSOR ON Signal
 </td></tr>
<tr><td>62</td><td>NTSC/PAL</td><td>I</td><td></td><td>NTSC/PAL selecting pin. NTSC by "H", PAL by "L"</td></tr>
<tr><td>63</td><td>NC</td><td></td><td></td><td></td></tr>
<tr><td>64</td><td>CLOG</td><td>I</td><td>Q108 Ⓒ</td><td>Head Clog detection signal input: Clog by "H"</td></tr>
<tr><td>65</td><td>Drum SEL</td><td>I</td><td></td><td>Not used</td></tr>
<tr><td>66</td><td>NC</td><td></td><td></td><td></td></tr>
<tr><td>67</td><td>Vss</td><td></td><td>GND</td><td></td></tr>
<tr><td>68</td><td>EA</td><td>I</td><td>GND</td><td></td></tr>
<tr><td>69</td><td>ME/MP</td><td>I</td><td>P3001 ①</td><td>ME/MP tape recognition input: ME Tape is selected with "H"</td></tr>
<tr><td>70</td><td>REC PROOF</td><td>I</td><td>P3001 ③</td><td>REC PROOF recognition input
REC PROOF is selected with "L"</td></tr>
<tr><td>71</td><td>CST DOWN</td><td>I</td><td>P3001 ⑬</td><td>CASSETTE IN Switch input : CST IN is selected with "L"</td></tr>
<tr><td>72
73
74</td><td>MODE 2
MODE 1
MODE 0</td><td>I
I
I</td><td>P3001 ⑨-⑪</td><td>Mechanical position input
<table>
<tr><th>SW \ MODE</th><th>Eject</th><th></th><th>Initial</th><th></th><th>Stop</th><th></th><th>PB</th></tr>
<tr><td>MODE SW 2</td><td>0</td><td>1</td><td>0</td><td>1</td><td>1</td><td>1</td><td>0</td></tr>
<tr><td>MODE SW 1</td><td>1</td><td>1</td><td>0</td><td>0</td><td>0</td><td>1</td><td>1</td></tr>
<tr><td>MODE SW 0</td><td>1</td><td>1</td><td>1</td><td>1</td><td>0</td><td>0</td><td>0</td></tr>
</table></td></tr>
<tr><td>75</td><td>T-Reel FG</td><td>I</td><td>P3001 ⑥</td><td>Take-up Reel FG input</td></tr>
<tr><td>76</td><td>Reel LED</td><td>I</td><td>R001</td><td>LED for Reel Sensor drive control
LED Flashing is selected with "L"</td></tr>
<tr><td>77</td><td>VDD</td><td>I</td><td>S/S 5V</td><td></td></tr>
<tr><td>78
79</td><td>SEL 2
SEL 1</td><td>O
O</td><td>ATF IC (IC316)
㉑, ㉓</td><td>ATF REF PILOT Selecting signal
selecting signal frequency (f1 to f4)
<table>
<tr><th>ATF REF PILOT</th><th>f1</th><th>f2</th><th>f3</th><th>f4</th></tr>
<tr><td>SEL 1</td><td>H</td><td>L</td><td>H</td><td>L</td></tr>
<tr><td>SEL 2</td><td>H</td><td>H</td><td>L</td><td>L</td></tr>
</table></td></tr>
<tr><td>80</td><td>REF</td><td>O</td><td></td><td>Not used</td></tr>
</table>

2-6-1-3. Interface

1) System control-Video Audio Block Interface.

Signal Name	Pin No.	VCR MODE									CAMERA MODE			
		STOP	FF	REW	PB	CUE	REV	STILL	REC	PAUSE	ST-BY	REC	EDIT SEARCH	
													FWD	RVS
RP PB	57	H	H	H	H	H	H	H	L	H	H	L	H	H
EE (H)	56	H	H	H	L	L	L	L	H	H	H	H	L	L
SP/LP OUT (H/L)	55	*1	H	H	*2	*2	*2	*1	H	H	H	H	H	H
JOG (H)	54	L	L	L	L	H	H	H	L	L	L	L	L	H
Audio Mute (H)	53	L	L	L	L	H	H	H	L	L	L	L	L	H
FE ON (L)	52	H	H	H	H	H	H	H	L	H	H	L	H	H
Video Mute (H)	51	L	L	L	L	L	L	L	L	L	L	L	L	L
EDIT (L)	50	H	H	H	*3	*3	*3	*3	H	H	H	H	H	H
RF SWP	13	H/L	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4
SOG VD	14	L	L	L	L	*5	*5	*5	L	L	L	L	L	*5

*1. Outputs the determination result of last mode. SP mode "H", LP mode "L".
*2. Outputs the determination result of recording mode of playback tape. SP mode "H", LP mode "L".
*3. Outputs the interlocked position with EDIT key. Normal mode "H", EDIT mode "L"
*4. 30Hz duty 50% pulse (synchronized to drum rotation)
*5. Simulated VD signal.

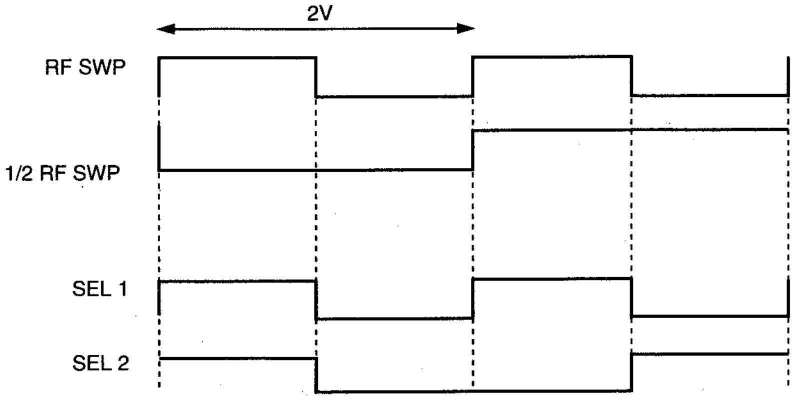
2) System control-Servo Block Interface.

Signal Name	Pin No.	VCR MODE									CAMERA MODE			
		STOP	FF	REW	PB	CUE	REV	STILL	REC	PAUSE	ST-BY	REC	EDIT SEARCH	
													FWD	RVS
T Reel FG	75	—	*1	*1	*1	*1	*1	*1	*1	—	—	*1	*1	*1
S Reel FG	6	—	*1	*1	*1	*1	*1	*1	*1	—	—	*1	*1	*1
ATF Error	21	—	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2
Drum PG	1	—	*3	*3	*3	*3	*3	*3	*3	*3	*3	*3	*3	*3
Drum FG	10	—	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4
Capstan FG	9	—	*5	*5	*5	*5	*5	*5	*5	*5	*5	*5	*5	*5
Capstan ON	37	L	H	H	H	H	H	L	H	L	L	H	H	H
SEL 2	78	H	*6	*6	*8	*7	*7	L	*6	H	H	*6	*8	*11
SEL 1	79	L	*6	*6	*8	*7	*7	L	*6	L	L	*6	*8	*11
Capstan FWD	38	H	H	L	H	H	L	H	H	H	H	H	H	L
Drum FWD	35	L	L	L	L	L	L	L	L	LL	L	L	L	L
Drum PWM	17	—	*9	*9	*9	*9	*9	*9	*9	*9	*9	*9	*9	*9
Capstan PWM	18	—	*9	*9	*9	*9	*9	—	*9	—	—	*9	*9	*9
Drum ON	36	L	H	H	H	H	H	H	H	H	H	H	H	H
Drum ACCL	40	H	*10	*10	*10	*10	*10	*10	*10	*10	*10	*10	*10	*10

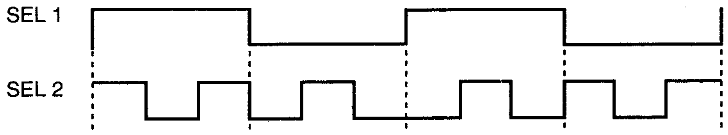
*1. Pulse is input by reel rotation
*2. ATF error voltage input
*3. 1 PG pulse is input with 1 rotation of Drum. Approx. 30 Hz
*4. 12 FG pulses are input with 1 rotation of Drum. Approx. 360 Hz
*5. 520 FG pulses are input with 1 rotation of Capstan Approx. 950 Hz during REC/PB (SP)
*6. See timing chart 1.
*7. See timing chart 2.
*8. See timing chart 3.
*9. 23.4 KHz PWM signal
*10. "L" when drum motor starting
*11. See timing chart 4.

3) Timing Chart

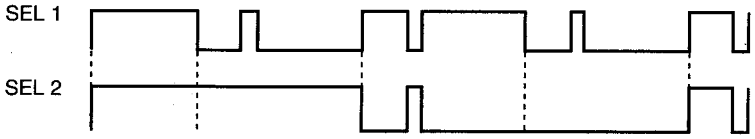
Timing chart 1
FF, REW, REC


2V
RF SWP
1/2 RF SWP
SEL 1
SEL 2

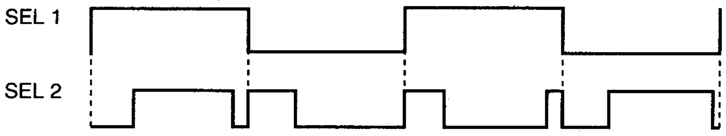
Timing chart 2
PICTURE-SEARCH (CUE/REV)



Timing chart 3
PB, EDIT-SEARCH (FWD)



Timing chart 4
EDIT-SEARCH (RVS)



2-6-2. MASTER CONTROL SYSTEM TERMINAL FUNCTION DESCRIPTION (MC-10BD IC401 μPD75028)

Pin No	Signal Name	I/O	Functions and In/out level
1	REC (L)	O	"L" when line record, for LED drive
2	EME (L)	O	"L" when emergency or DEW, for LED drive 1Hz low pulse train when battery 1st pre-down," 2Hz low pulse train when battery 2nd pre-down,"
3	TALLY (L)	O	"L" when camera record, for LED drive
4 5	V-MUTE A-MUTE	O O	"H" pulse when power on/off, for audio/video mute (T=2.5sec)
6	CAM/LINE (L)	O	"H" when camera mode, others are "L"
7	CS-CHK	I	"CS" level check when titler chip select timing
8	CS	O	Titler and S/S chip select signal output, CS period is 31.3msec Titler mode → "L" S/S mode → "H"
9	VSS	—	Connected to GND
10	S-IN	I	Serial data input. "L" pulse train
11	S-OUT	O	Serial data output. "H" pulse train
12	S CK (L)	O	Serial clock. "L" pulse train
13	BATT IN (L)	I	Ever 5V detect port, "L" when battery in
14	XT-OUT	O	32kHz X-tal freq. /16 signal output when adjust.
15	BLC ON (L)	O	Normally "L". "H" when back light control
16	FADE	O	Fade in → PWM output from "H" to "L" Fade out → PWM output from "L" to "H"
17 18	NC		
19	AF	O	Nomally "H". "L" when manual focus
20 21	WB1 WB0	O O	White Balance mode select (WB1, WB0) AUTO, HOLD, OUTDOOR, INDOOR
22	RESET	I	Nomally "H"
23 24	X1 X2	I I	Ceramic oscillation circuit for main system clock. Oscillation frequency is 4.19MHz.
25	NC		
26 27	XT1 XT2	I —	X-tal oscillation circuit for sub system clock. Oscillation frequency is 32.768kHz.
28 29 30	VDD AVDD AVref+	— —	Ever 5V
31	AVref−	—	Connected to GND
32 33	NC		
34	REMOCON	I	A/D port for wired remocon input

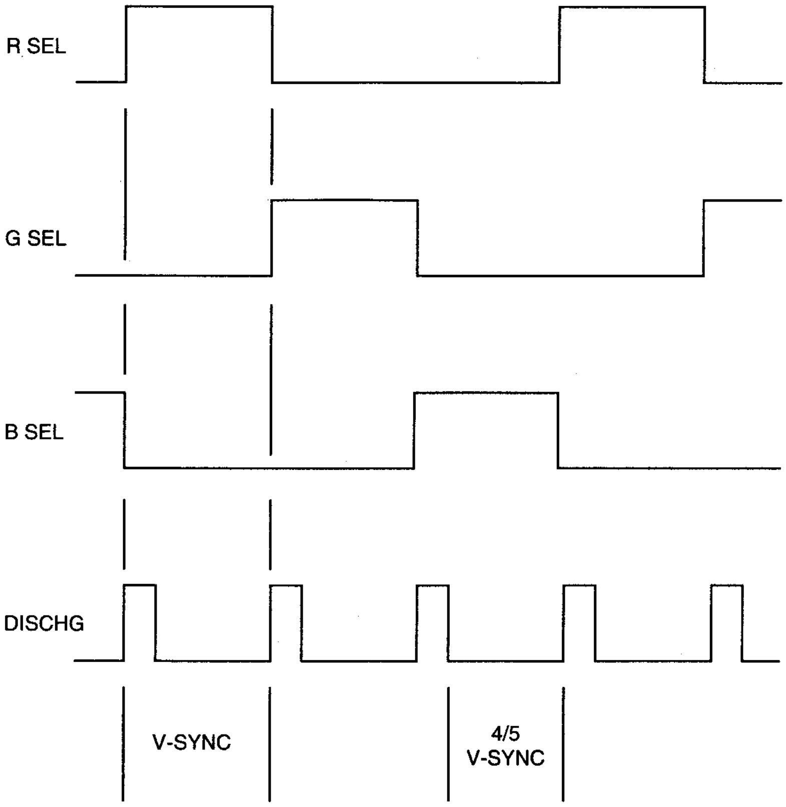
Pin No	Signal Name	I/O	Functions and In/out level
35 -- 39	NC		
40	AVSS	—	Connected to GND
41	TEST (L)	I	"L" when 32kHz X-tal adjust.
42	MODE RDY (L)	I	Normally "L", "H" when title operating mode.
43	L.P.END (L)	I	Lithium Battery pre-end detect. Nomally "H", "L" when lithium battery low
44	NC		
45	CAMON	O	Camera power on "H" when CAMERA mode
46	VTRON	O	VTR power on "H" when VTR ON mode
47 48	SYSRST (L)	O O	System reset "L" output (500mSEC) when power on. "L" (30mSEC) when CS-CHK error detect. Nomally "H".
49	NC		
50	CLKFAST	I	Nomally "H", "L" when clock test
51 52	NC		
53 -- 60	K7 -- K0	I	Key scan input port. Nomally "H", "L" pulse train when key in.
61 -- 64	S3 -- S0	O	"L" Scan output. period is 9.75msec. Nomally open. Low pulse train when key in.

2-6-3. EVR/AWB CONTROL SYSTEM TERMINAL FUNCTION DESCRIPTION (TWB-10BD IC861 μPD75006)

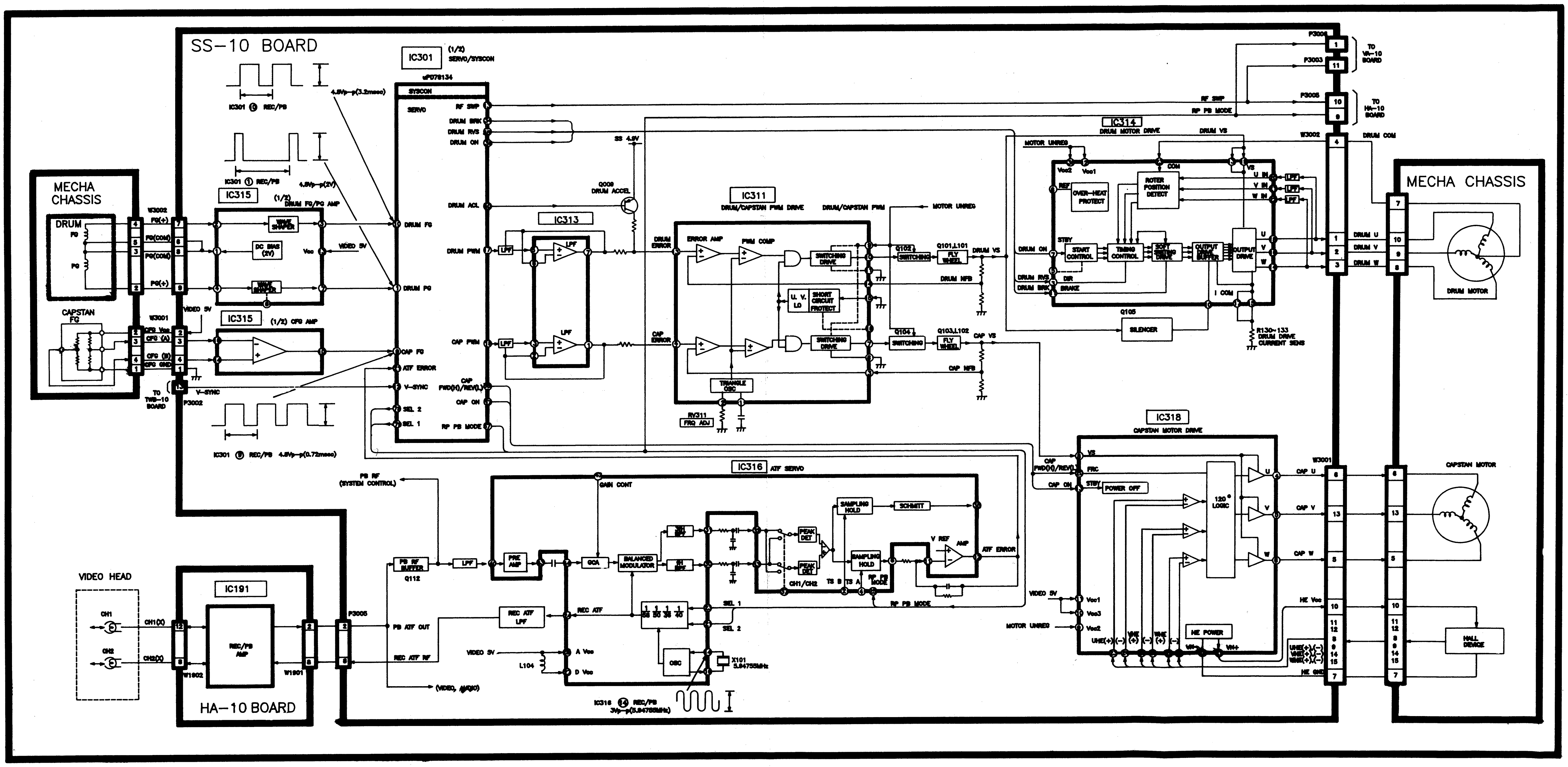
Pin No	Signal Name	I/O	Functions and in/out level
1	R SEL	O	WB-R signal select. 3 V-sync period pulse. "H" time 1 V-sync. Refer. to timing diagram
2	DISCHG	O	Triangle waveform generation control signal. "H" time 1/5 V. Refer. to timing diagram
3	B SEL	O	WB-B signal select. 3 V-sync period high pulse. "H" time 1 V-sync. Refer. to timing diagram.
4	IN/OUT	I	"L" when OUTDOOR mode operation.
5	CAM ADJ	I	"L" when camera adjust mode.
6 7	WB1 WBO	I I	White balance mode select port. 00: AUTO. 01: HOLD. 10: OUTDOOR. 11: INDOOR.
8 - 11	NTSC/ PAL (L)	I	Not used
12 - 16	NC		
17 18	GND	—	Connected to back up GND.
19	NC		
20	RESET	I	For μ-COM RESET.
21 22	X1 X2	I I	X-tal oscillation circuit for clock. Oscillation frequency is 4.19MHz.
23 24 25	NC		
26	VTESTO	O	Test V-sync output. Duty 50 pulse
27	EVER LD	O	Strobe for EVR IC. "H" Pulse train.
28	EEP CS	O	chip select signal for EEPROM. "H" active
29	SI	I	Serial data input. (EEPROM data in)
30	SO	O	Serial data output. (Data out to EEPROM and EVR)
31	CLK	O	Serial clock.
32	ON/OFF	I	Camera mode check. No-operation when CAM off.
33 34	NC		
35	REMOCON	I	Serial communication to adjustment jig. (Data in)
36	AWIN	I	PWM data of selected signal. "L" Pulse train
37	V-SYNC	I	Negative V-sync input.
38	NC		
39	VDD	—	Ever 5V

Pin No	Signal Name	I/O	Functions and in/out level
40	NC		
41	S OUT	O	Serial communication to adjustment jig. (Data out)
42 43	NC		
44	G SEL	O	WB-R signal select. 3 V-sync period pulse. "H" time 1 V sync. Refer. to timing diagram.

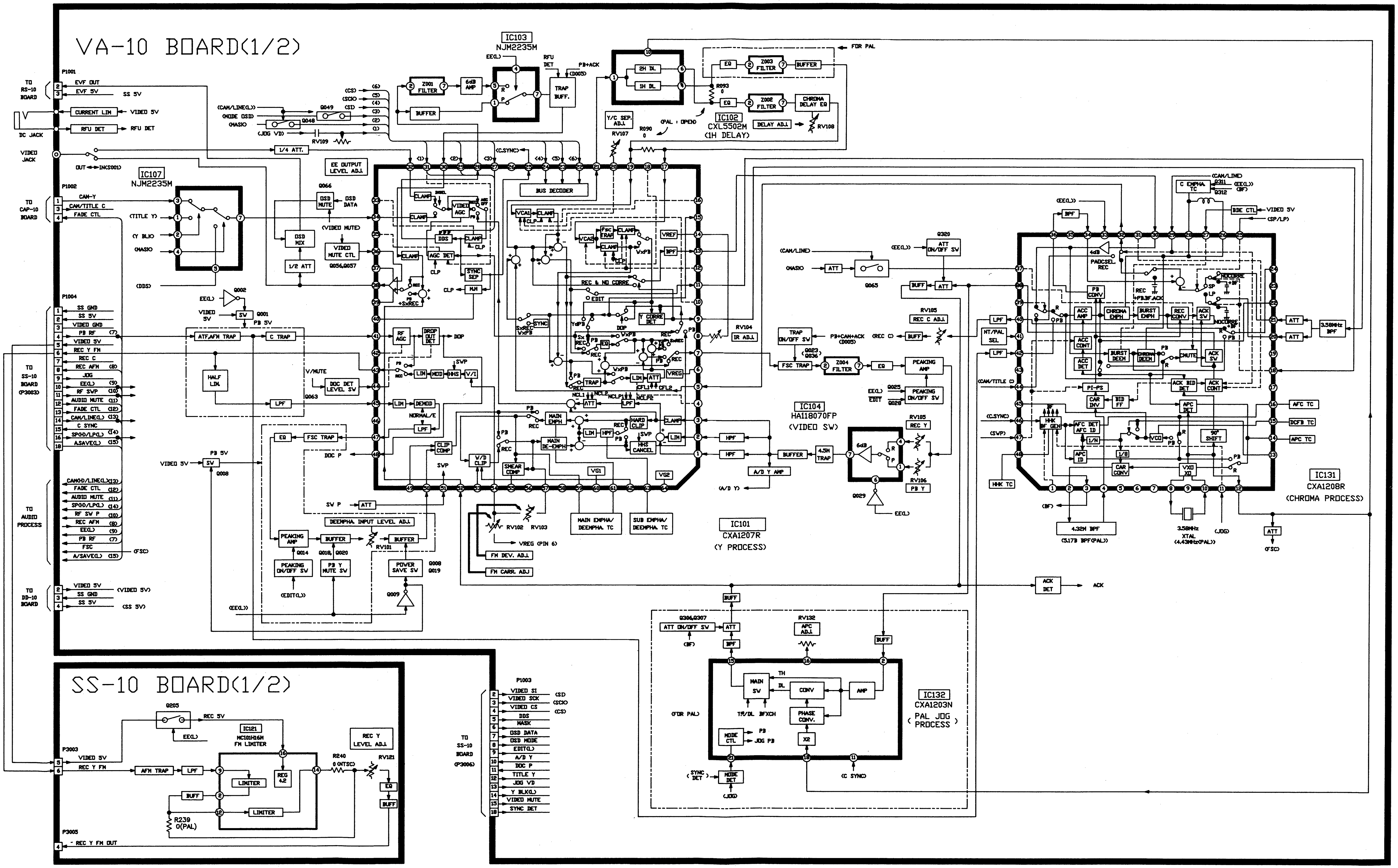
**TIMING DIAGRAM


R SEL
G SEL
B SEL
DISCHG
V-SYNC
4/5
V-SYNC

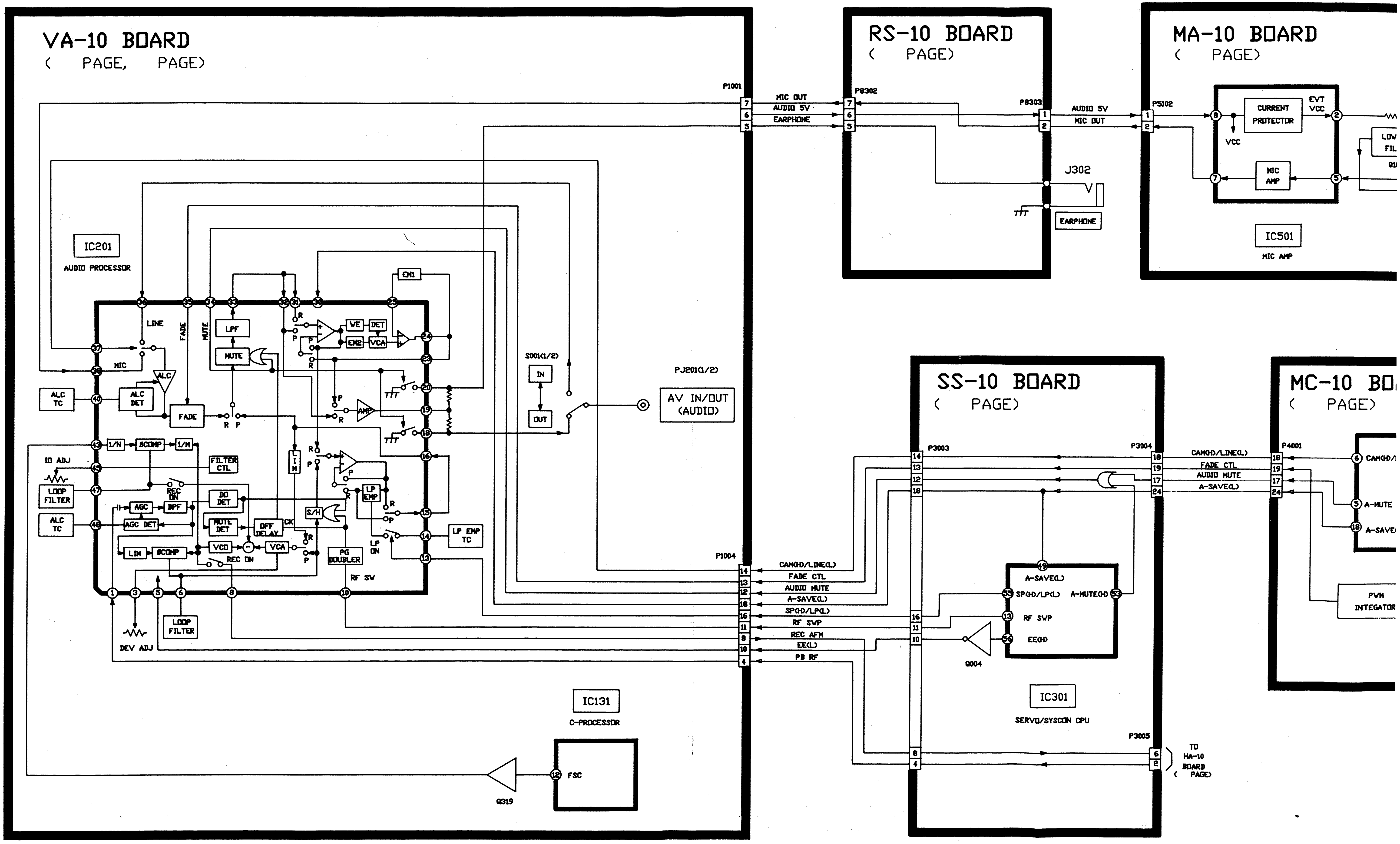
2-7. SERVO BLOCK DIAGRAM


SS-10 BOARD
IC301 (1/2) SERVO/SYSCON
uPD78134
SYSCON
SERVO
RF SWP
DRUM BRK
DRUM RVS
DRUM ON
DRUM ACL
DRUM FG
DRUM PWM
DRUM PG
CAP PWM
CAP FG
ATF ERROR
V-SYNC
CAP FWD(H)/REV(L)
CAP ON
SEL 2
SEL 1
RP PB MODE
IC301 ⑩ REC/PB 4.8Vp-p(3.2msec)
IC301 ① REC/PB 4.8Vp-p(2V)
IC301 ⑨ REC/PB 4.8Vp-p(0.72msec)
MECHA CHASSIS
DRUM
FG
PG
CAPSTAN FG
W3002
FG(+)
FG(COM)
PG(COM)
PG(+)
W3001
CFG Vcc
CFG (A)
CFG (B)
CFG GND
TO TWB-10 BOARD
P3002
IC315 (1/2) DRUM FG/PG AMP
WAVE SHAPER
DC BIAS (2V)
Vcc
VIDEO 5V
IC315 (1/2) CFG AMP
IC313
LPF
Q009 DRUM ACCEL
SS 4.9V
IC311 DRUM/CAPSTAN PWM DRIVE
DRUM/CAPSTAN PWM
MOTOR UNREG
DRUM ERROR
CAP ERROR
ERROR AMP
PWM COMP
SWITCHING DRIVE
U. V. LO
SHORT CIRCUIT PROTECT
TRIANGLE OSC
RV311 FRQ ADJ
Q102 SWITCHING
Q101,L101 FLY WHEEL
DRUM VS
DRUM NFB
Q104 SWITCHING
Q103,L102 FLY WHEEL
CAP VS
CAP NFB
IC314 DRUM MOTOR DRIVE
MOTOR UNREG
Vcc2
Vcc1
COM
VS
REF
OVER-HEAT PROTECT
ROTER POSITION DETECT
U IN
V IN
W IN
STBY
START CONTROL
TIMING CONTROL
SOFT SWITCHING DRIVE
OUTPUT DRIVE BUFFER
OUTPUT DRIVE
U
V
W
DRUM ON
DRUM RVS
DRUM BRK
DIR
BRAKE
I COM
Q105 SILENCER
R130~133 DRUM DRIVE CURRENT SENS
P3006
P3003
TO VA-10 BOARD
P3005
TO HA-10 BOARD
RF SWP
RP PB MODE
DRUM COM
DRUM U
DRUM V
DRUM W
DRUM MOTOR
IC316 ATF SERVO
PB RF (SYSTEM CONTROL)
PB RF BUFFER
Q112
PRE AMP
GAIN CONT
GCA
BALANCED MODULATOR
BPF
PEAK DET
CH1/CH2
SAMPLING HOLD
SCHMITT
V REF
AMP
TS B
TS A
RP PB MODE
REC ATF
REC ATF LPF
1/58 1/50 1/38 1/40
SEL 1
SEL 2
OSC
X101 5.94755MHz
A Vcc
D Vcc
L104
VIDEO 5V
PB ATF OUT
REC ATF RF
(VIDEO, AUDIO)
IC316 ⑭ REC/PB 3Vp-p(5.94755MHz)
VIDEO HEAD
CH1
CH2
CH1(X)
CH2(X)
IC191
REC/PB AMP
W1902
W1901
HA-10 BOARD
IC318 CAPSTAN MOTOR DRIVE
VS
FRC
STBY
POWER OFF
120° LOGIC
Vcc1
Vcc3
Vcc2
MOTOR UNREG
UHE(+) (-)
VHE (+) (-)
WHE (+) (-)
HE POWER
VH-
VH+
CAP U
CAP V
CAP W
HE Vcc
UHE(+),(-)
VHE(+),(-)
WHE(+),(-)
HE GND
CAPSTAN MOTOR
HALL DEVICE

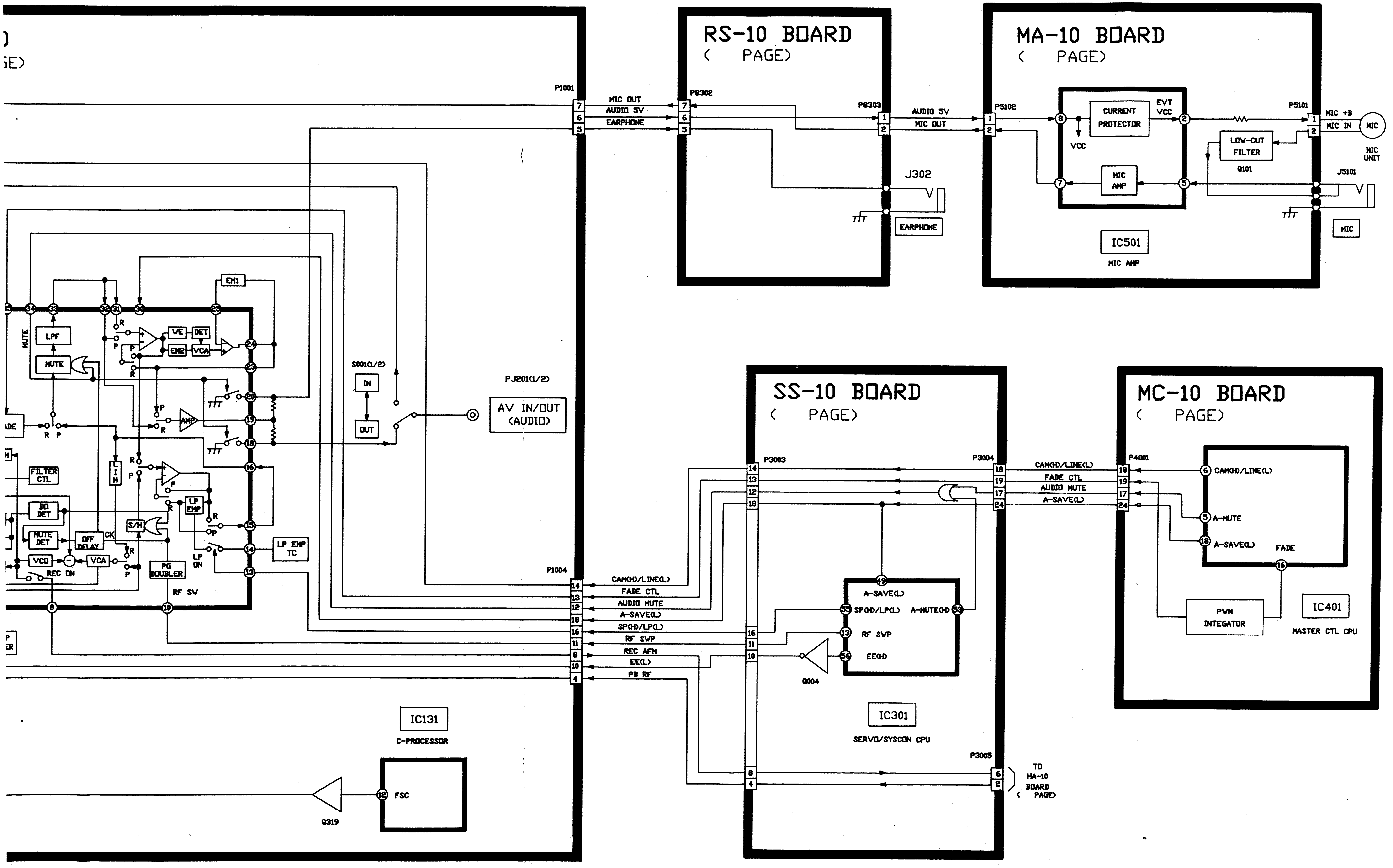
2-8. VIDEO BLOCK DIAGRAM (VA-10BD)


VA-10 BOARD(1/2)
SS-10 BOARD(1/2)
TO RS-10 BOARD
EVF OUT
EVF 5V
SS 5V
CURRENT LIM
VIDEO 5V
RFU DET
DC JACK
VIDEO JACK
1/4 ATT.
IC107
NJM2235M
TO CAP-10 BOARD
CAM-Y
CAM/TITLE C
FADE CTL
IC103
NJM2235M
Z001 FILTER
6dB AMP
BUFFER
TRAP BUFF.
2H DL
1H DL
IC102
CXL5502M
(1H DELAY)
DELAY ADJ.
RV108
Y/C SEP. ADJ.
RV107
Z003 FILTER
Z002 FILTER
CHROMA DELAY EQ
FOR PAL
EE OUTPUT LEVEL ADJ.
BUS DECODER
OSD MUTE
OSD MIX
1/2 ATT
VIDEO MUTE CTL
ATF/AFM TRAP
C TRAP
HALF LIM.
LPF
DOC DET LEVEL SW
FSC TRAP
EQ
PEAKING AMP
BUFFER
DEEMPHA INPUT LEVEL ADJ.
PEAKING ON/OFF SW
PB Y MUTE SW
POWER SAVE SW
FM DEV. ADJ.
FM CARR. ADJ
RV102
RV103
MAIN EMPHA/ DEEMPHA TC
SUB EMPHA/ DEEMPHA TC
IC101
CXA1207R
(Y PROCESS)
TO SS-10 BOARD (P3003)
TO AUDIO PROCESS
TO DD-10 BOARD
IC104
HA118070FP
(VIDEO SW)
TRAP ON/OFF SW
Z004 FILTER
PEAKING AMP
PEAKING ON/OFF SW
RV105
RV106
4.5M TRAP
A/D Y AMP
ATT ON/OFF SW
IC131
CXA1208R
(CHROMA PROCESS)
3.58MHz BPF
3.58MHz XTAL (4.43MHz(PAL))
4.43M BPF (3.17B BPF(PAL))
AFC TC
DCFB TC
APC TC
HHK TC
ACK DET
ACK
IC132
CXA1203N
(PAL JOG PROCESS)
MAIN SW
CONV
AMP
PHASE CONV.
MODE CTL
X2
MODE DET
APC ADJ.
RV132
TO SS-10 BOARD (P3006)
P1003
IC121
MC101H16M
FM LIMITER
REC Y LEVEL ADJ.
AFM TRAP
LIMITER
REG 4.2
RV121
R240 0 (NTSC)
R239 0(PAL)
P3003
P3005
REC Y FM OUT

2-9. AUDIO BLOCK DIAGRAM (VA-10BD)

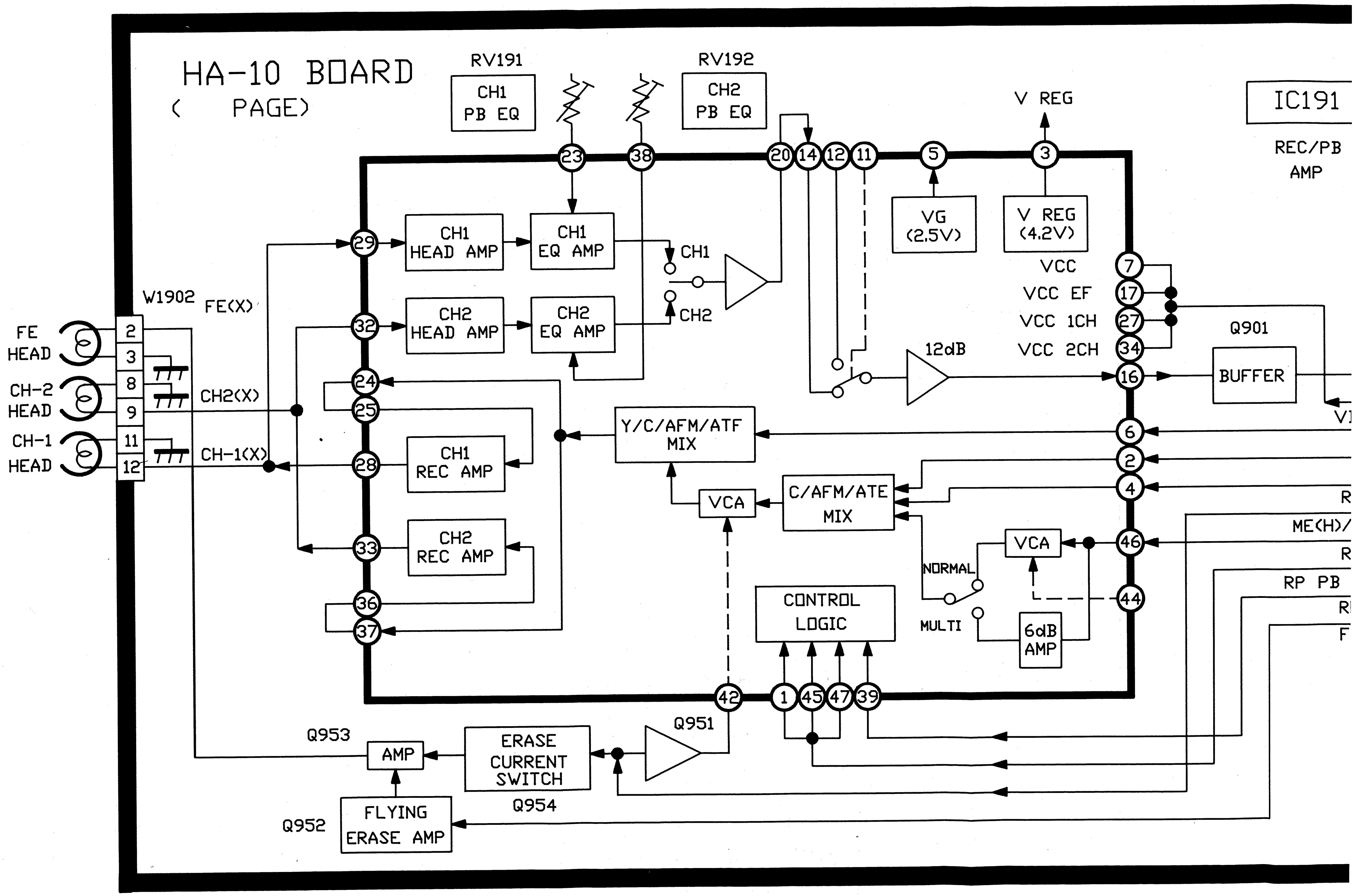

VA-10 BOARD
(PAGE, PAGE)
RS-10 BOARD
(PAGE)
MA-10 BOARD
(PAGE)
SS-10 BOARD
(PAGE)
MC-10 BO
(PAGE)
IC201
AUDIO PROCESSOR
LINE
MIC
FADE
MUTE
LPF
ALC
ALC TC
ALC DET
EM1
EM2
WE
DET
VCA
AMP
LIM
S/H
LP EMP
LP EMP TC
LP ON
R
P
1/N
ßCOMP
FILTER CTL
IO ADJ
LOOP FILTER
REC ON
DO DET
AGC
BPF
AGC DET
MUTE DET
DFF DELAY
CK
LIM
VCO
REC ON
PG DOUBLER
RF SW
DEV ADJ
S001(1/2)
IN
OUT
PJ201(1/2)
AV IN/OUT (AUDIO)
P1001
MIC OUT
AUDIO 5V
EARPHONE
P8302
P8303
J302
EARPHONE
AUDIO 5V
MIC OUT
P5102
CURRENT PROTECTOR
EVT VCC
VCC
MIC AMP
LOW FIL
IC501
MIC AMP
P1004
CAM(H)/LINE(L)
FADE CTL
AUDIO MUTE
A-SAVE(L)
SP(H)/LP(L)
RF SWP
REC AFM
EE(L)
PB RF
P3003
P3004
P4001
A-SAVE(L)
SP(H)/LP(L)
A-MUTE(H)
RF SWP
EE(H)
Q004
IC301
SERVO/SYSCON CPU
P3005
TO HA-10 BOARD (PAGE)
CAM(H)/L
A-MUTE
A-SAVE
PWM INTEGRATOR
IC131
C-PROCESSOR
FSC
Q319

CK DIAGRAM (VA-10BD)

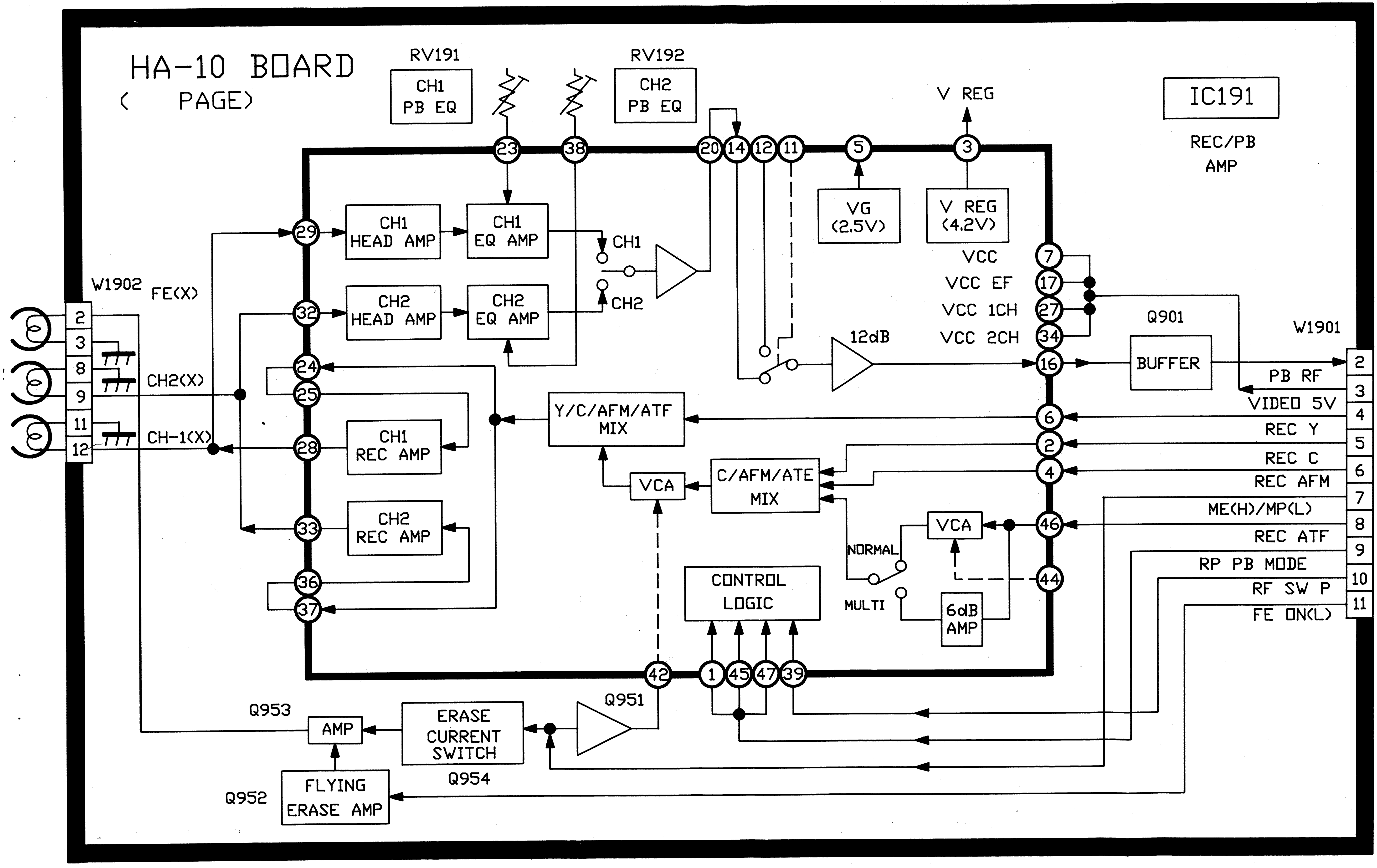


RS-10 BOARD
(PAGE)
MA-10 BOARD
(PAGE)
SS-10 BOARD
(PAGE)
MC-10 BOARD
(PAGE)
P1001
MIC OUT
AUDIO 5V
EARPHONE
P8302
P8303
AUDIO 5V
MIC OUT
J302
EARPHONE
P5102
CURRENT PROTECTOR
EVT VCC
VCC
MIC AMP
P5101
MIC +B
MIC IN
MIC
MIC UNIT
LOW-CUT FILTER
Q101
J5101
IC501
MIC AMP
MUTE
LPF
MUTE
EM1
VE
DET
EM2
VCA
AMP
S001(1/2)
IN
OUT
PJ201(1/2)
AV IN/OUT (AUDIO)
FILTER CTL
DO DET
MUTE DET
OFF DELAY
CK
VCO
VCA
REC ON
S/H
LP EMP
PG DOUBLER
RF SW
LP ON
LP EMP TC
LIM
P1004
CAM(H)/LINE(L)
FADE CTL
AUDIO MUTE
A-SAVE(L)
SP(H)/LP(L)
RF SWP
REC AFM
EE(L)
PB RF
P3003
P3004
CAM(H)/LINE(L)
FADE CTL
AUDIO MUTE
A-SAVE(L)
P4001
CAM(H)/LINE(L)
A-MUTE
A-SAVE(L)
FADE
PWM INTEGATOR
IC401
MASTER CTL CPU
A-SAVE(L)
SP(H)/LP(L)
A-MUTE(H)
RF SWP
EE(H)
Q004
IC301
SERVO/SYSCON CPU
P3005
TO HA-10 BOARD (PAGE)
IC131
C-PROCESSOR
FSC
Q319

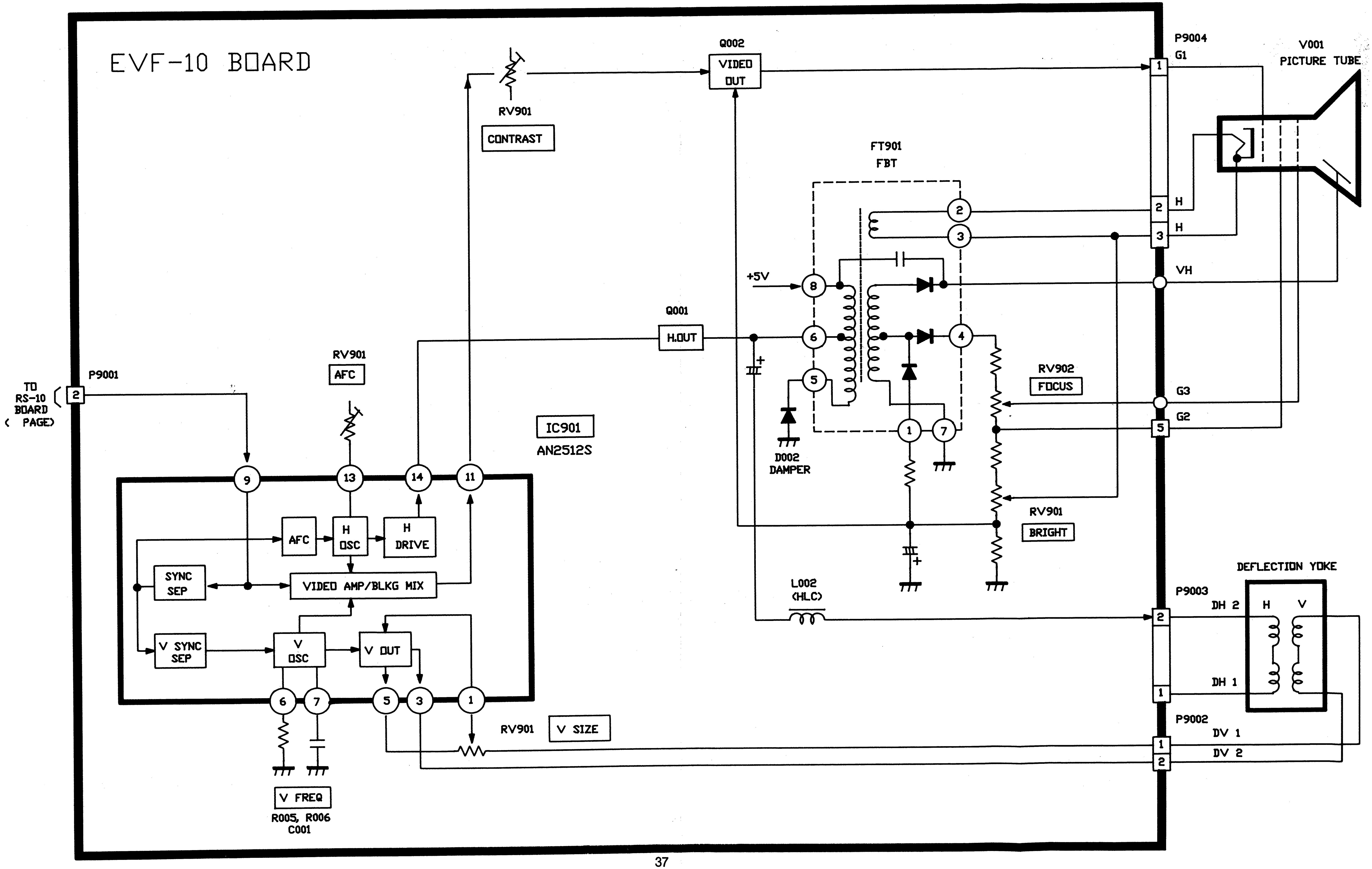
2-10. HEAD AMP BLOCK DIAGRAM (HA-10BD)


HA-10 BOARD
(PAGE)
RV191
CH1 PB EQ
RV192
CH2 PB EQ
V REG
IC191
REC/PB AMP
VG (2.5V)
V REG (4.2V)
VCC
VCC EF
VCC 1CH
VCC 2CH
Q901
BUFFER
12dB
CH1 HEAD AMP
CH1 EQ AMP
CH2 HEAD AMP
CH2 EQ AMP
CH1
CH2
CH1 REC AMP
CH2 REC AMP
Y/C/AFM/ATF MIX
C/AFM/ATE MIX
VCA
VCA
NORMAL
MULTI
6dB AMP
CONTROL LOGIC
W1902
FE(X)
CH2(X)
CH-1(X)
FE HEAD
CH-2 HEAD
CH-1 HEAD
2
3
8
9
11
12
Q953
AMP
ERASE CURRENT SWITCH
Q954
Q951
Q952
FLYING ERASE AMP
ME(H)/
RP PB
23
38
20
14
12
11
5
3
29
32
24
25
28
33
36
37
7
17
27
34
16
6
2
4
46
44
42
1
45
47
39

EAD AMP BLOCK DIAGRAM (HA-10BD)

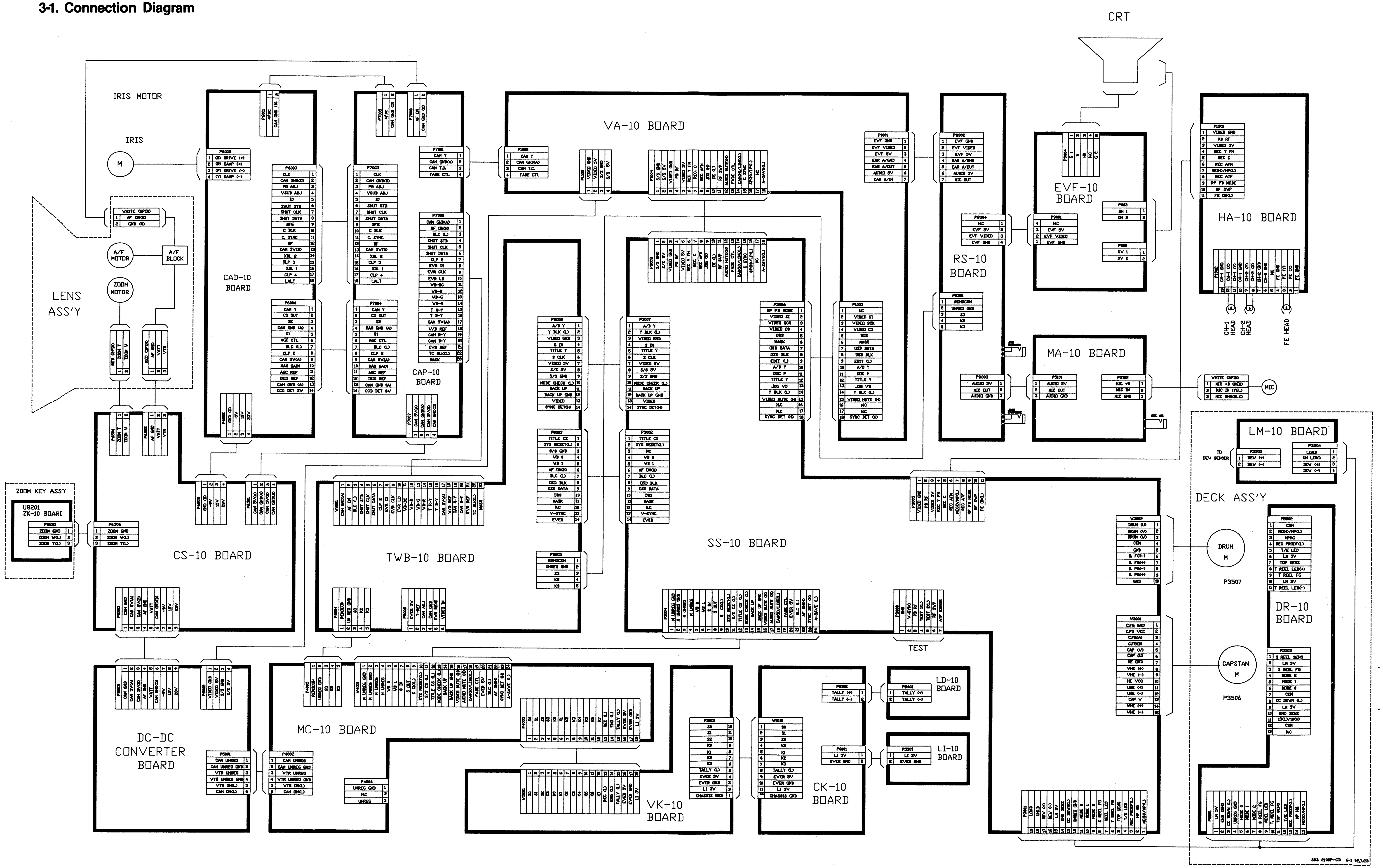

HA-10 BOARD
(PAGE)
RV191
CH1 PB EQ
RV192
CH2 PB EQ
V REG
IC191
REC/PB AMP
23
38
20
14
12
11
5
3
29
32
24
25
28
33
36
37
42
1
45
47
39
7
17
27
34
16
6
2
4
46
44
CH1 HEAD AMP
CH1 EQ AMP
CH2 HEAD AMP
CH2 EQ AMP
CH1
CH2
VG (2.5V)
V REG (4.2V)
VCC
VCC EF
VCC 1CH
VCC 2CH
12dB
Q901
BUFFER
W1901
W1902
FE(X)
CH2(X)
CH-1(X)
2
3
8
9
11
12
CH1 REC AMP
CH2 REC AMP
Y/C/AFM/ATF MIX
VCA
C/AFM/ATE MIX
VCA
NORMAL
MULTI
6dB AMP
CONTROL LOGIC
PB RF
VIDEO 5V
REC Y
REC C
REC AFM
ME(H)/MP(L)
REC ATF
RP PB MODE
RF SW P
FE ON(L)
2
3
4
5
6
7
8
9
10
11
Q953
AMP
ERASE CURRENT SWITCH
Q954
Q951
Q952
FLYING ERASE AMP

2-11. ELECTRONIC VIEW FINDER BLOCK DIAGRAM (EVF-10BD)


EVF-10 BOARD
RV901
CONTRAST
Q002
VIDEO OUT
P9004
G1
V001
PICTURE TUBE
FT901
FBT
H
H
VH
+5V
8
6
5
2
3
4
1
7
Q001
H.OUT
D002
DAMPER
RV902
FOCUS
G3
G2
RV901
BRIGHT
P9001
TO RS-10 BOARD (PAGE)
RV901
AFC
IC901
AN2512S
9
13
14
11
AFC
H OSC
H DRIVE
SYNC SEP
VIDEO AMP/BLKG MIX
V SYNC SEP
V OSC
V OUT
6
7
5
3
1
RV901
V SIZE
V FREQ
R005, R006
C001
L002
(HLC)
DEFLECTION YOKE
H
V
P9003
DH 2
DH 1
P9002
DV 1
DV 2

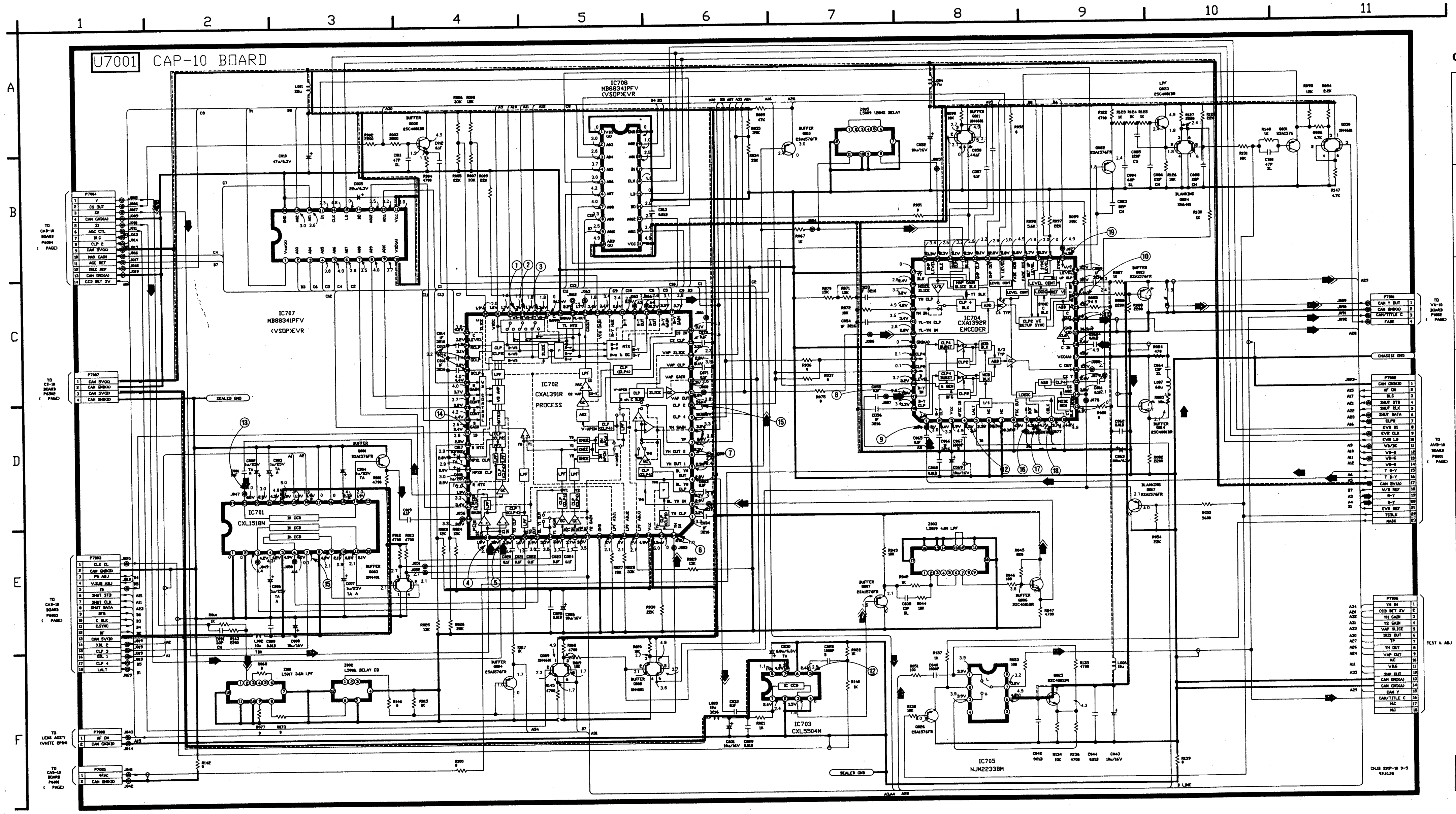
3. PRINTED CIRCUIT BOARDS AND SCHEMATIC DIAGRAMS

3-1. Connection Diagram

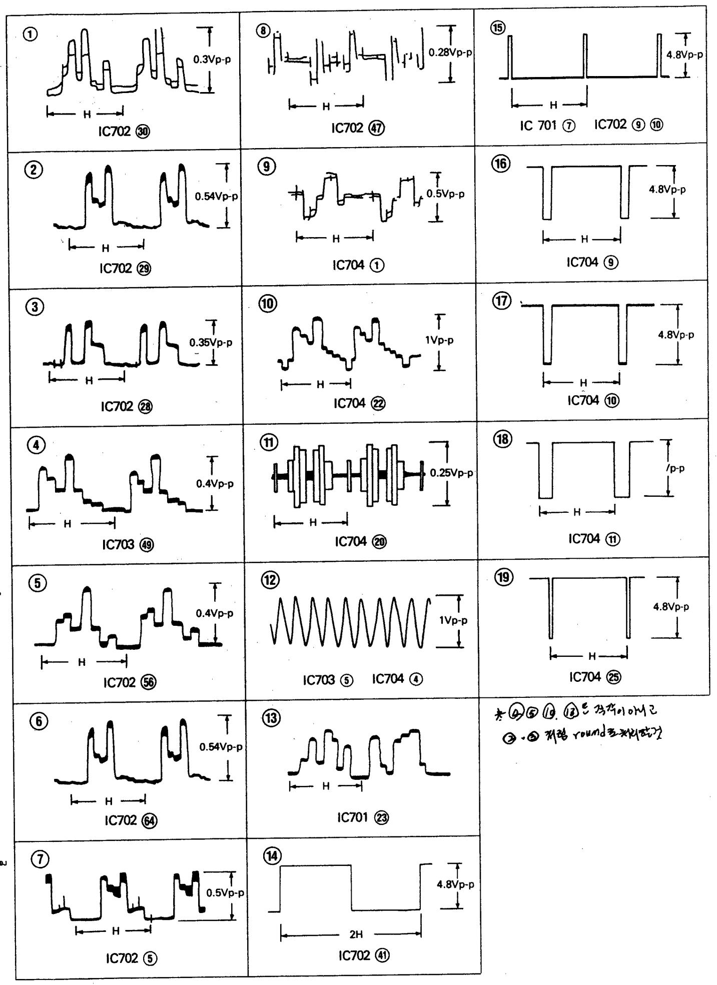

CRT
IRIS MOTOR
IRIS
M
LENS ASS'Y
A/F MOTOR
A/F BLOCK
ZOOM MOTOR
CAD-10 BOARD
CAP-10 BOARD
VA-10 BOARD
RS-10 BOARD
EVF-10 BOARD
HA-10 BOARD
CH-1 HEAD
CH-2 HEAD
FE HEAD
MA-10 BOARD
MIC
LM-10 BOARD
DECK ASS'Y
DRUM M
P3507
CAPSTAN M
P3506
DR-10 BOARD
ZOOM KEY ASS'Y
U8201 ZK-10 BOARD
CS-10 BOARD
TWB-10 BOARD
SS-10 BOARD
TEST
DC-DC CONVERTER BOARD
MC-10 BOARD
VK-10 BOARD
CK-10 BOARD
LD-10 BOARD
LI-10 BOARD

3-2. Printed Circuit Boards and Schematic Diagram

• CAP-10BD


1
2
3
4
5
6
7
8
9
10
11
A
B
C
D
E
F
U7001 CAP-10 BOARD
IC708 MB88341PFV (VSDP)EVR
IC707 MB88341PFV (VSDP)EVR
IC701 CXL1518N
IC702 CXA1391R PROCESS
IC703 CXL5504M
IC704 CXA1392R ENCODER
IC705 NJM2233BM
TEST & ADJ

CAP-10 BD

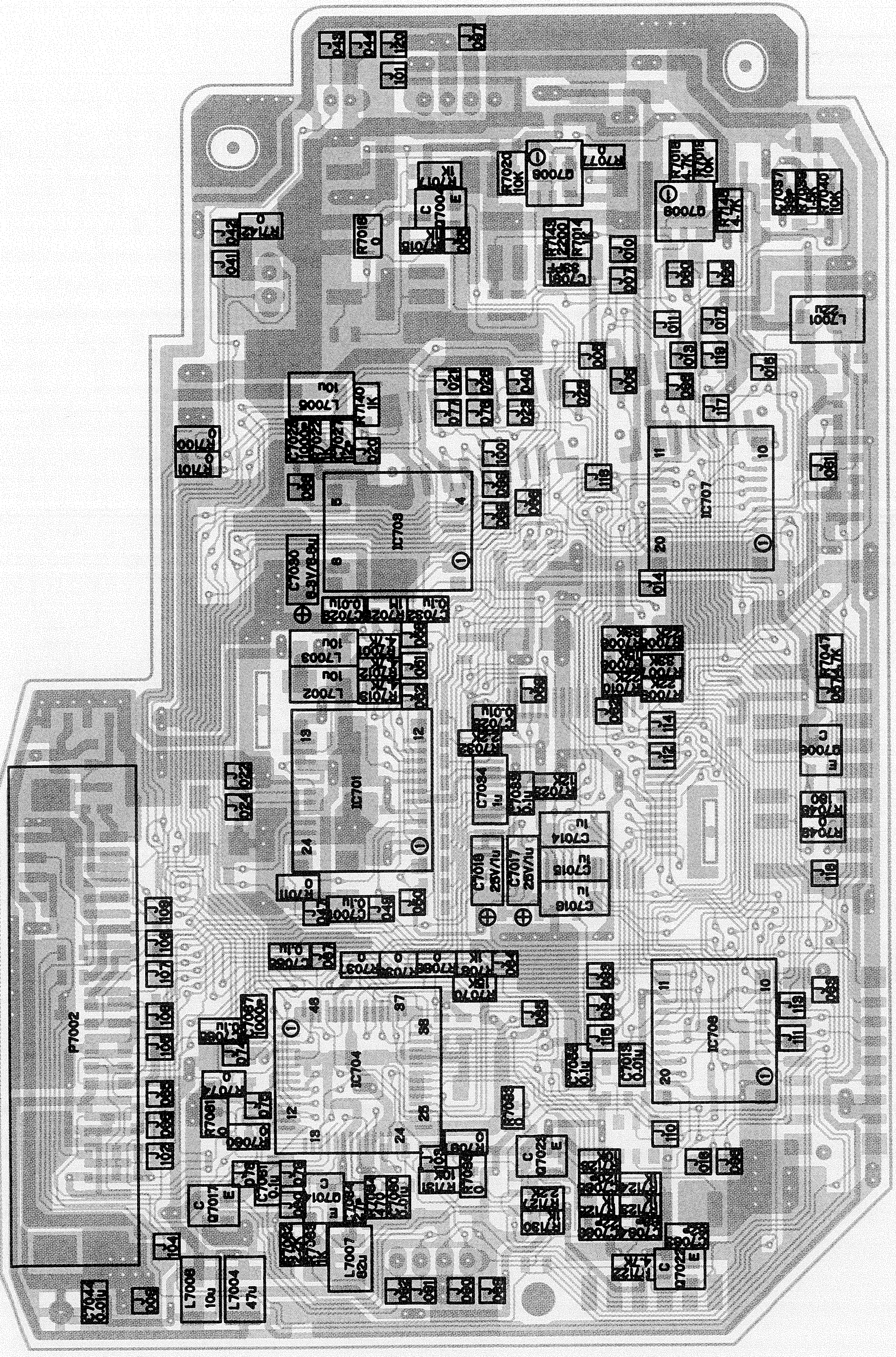


* ④⑤⑩, ⑬은 각각이 아니고
②-⑥ 처럼 round로 처리할것

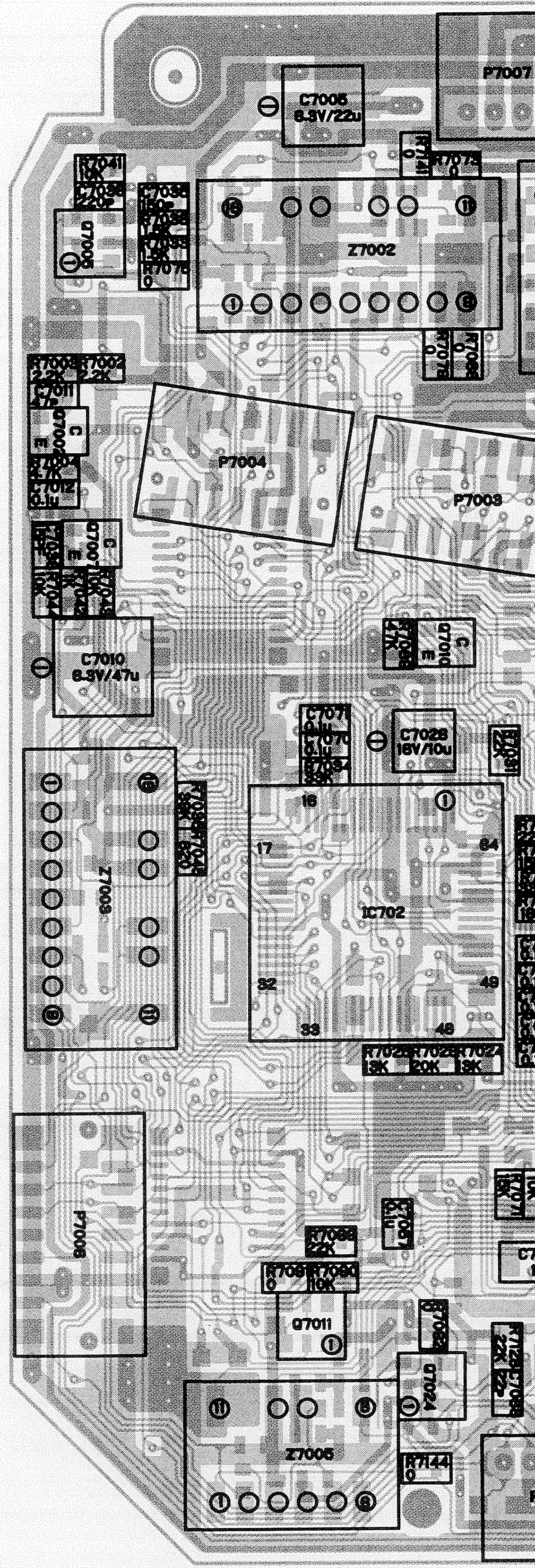
Signal path

VIDEO Signal	
CHROMA	Y
➡	⮆

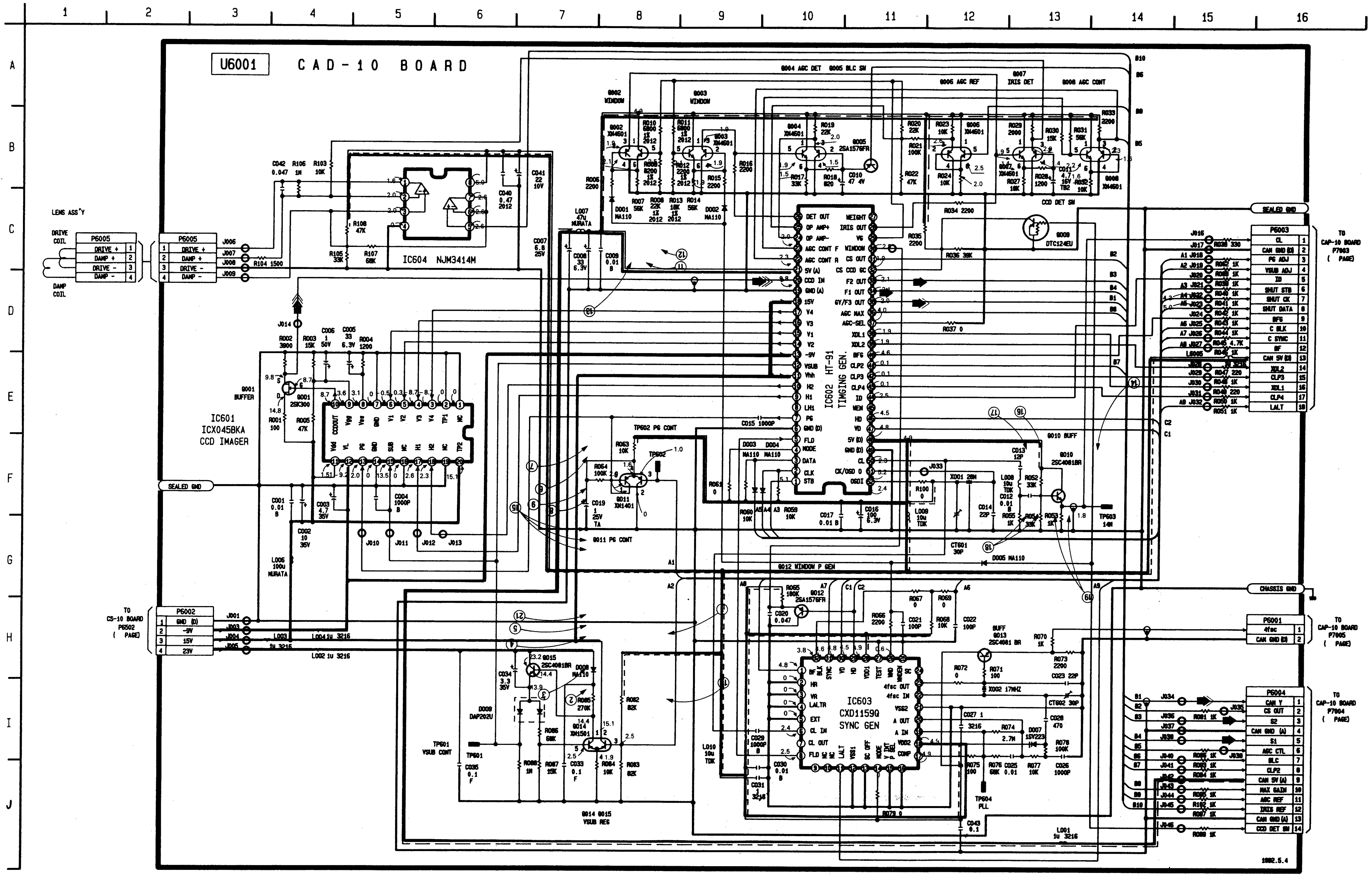
- **CAP-10BD** (SIDE-A)



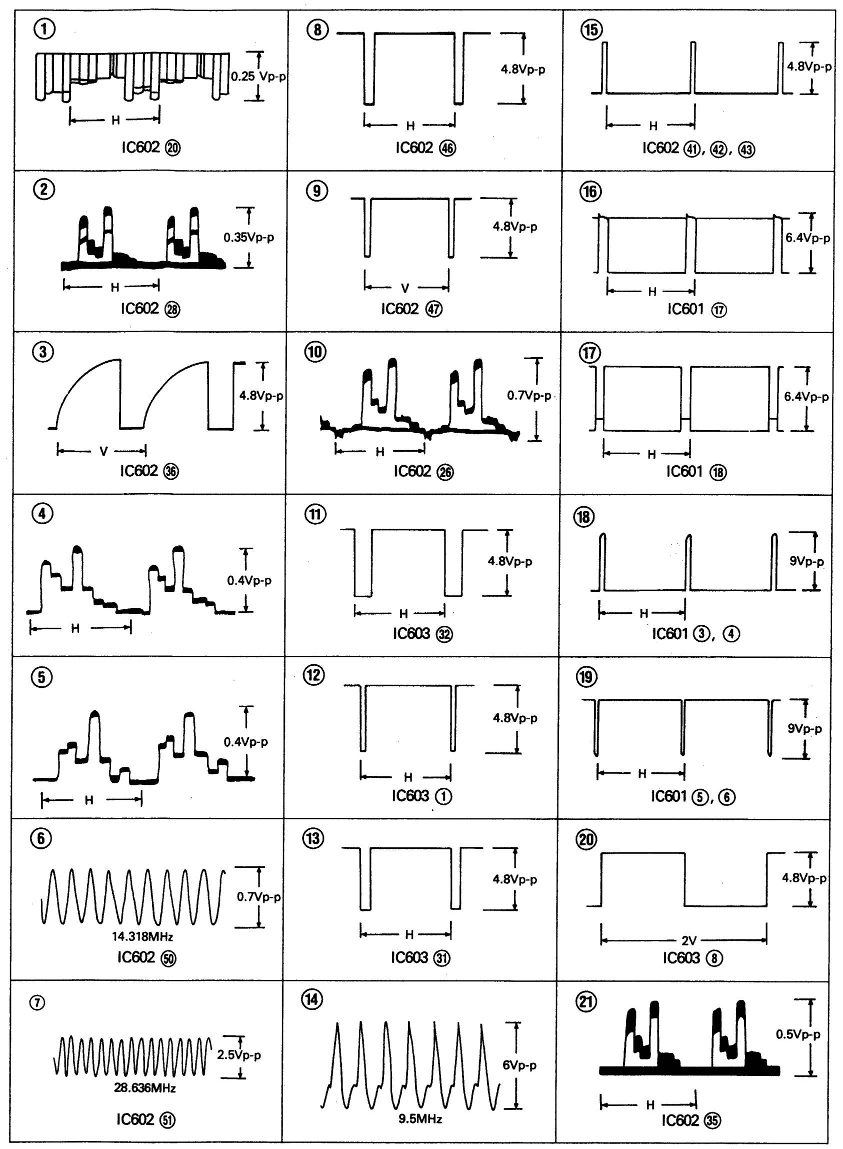
- **CAD-10BD** (SIDE-B)



• CAD-10BD


1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
A
B
C
D
E
F
G
H
I
J
U6001
CAD-10 BOARD
IC604 NJM3414M
IC601
ICX045BKA
CCD IMAGER
IC602 HT-91
TIMING GEN.
IC603
CXD1159Q
SYNC GEN
LENS ASS'Y
DRIVE COIL
DAMP COIL
P6005
DRIVE +
DAMP +
DRIVE -
DAMP -
SEALED GND
CHASSIS GND
P6002
GND (D)
-9V
15V
23V
TO CS-10 BOARD P6502 (PAGE)
P6003
TO CAP-10 BOARD P7003 (PAGE)
P6001
4fsc
CAM GND (D)
TO CAP-10 BOARD P7005 (PAGE)
P6004
TO CAP-10 BOARD P7004 (PAGE)
1992.5.4

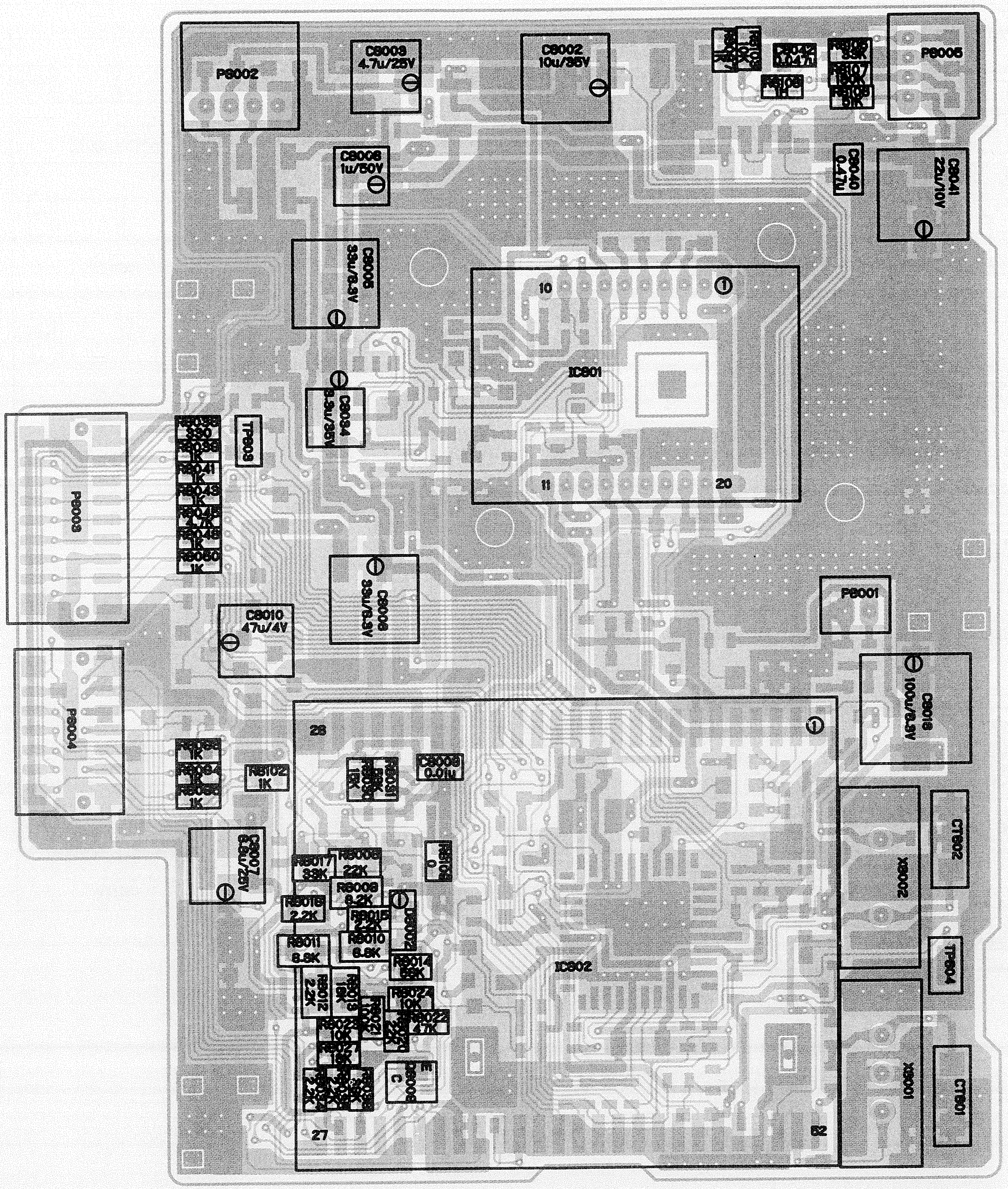
CAD-10 BD



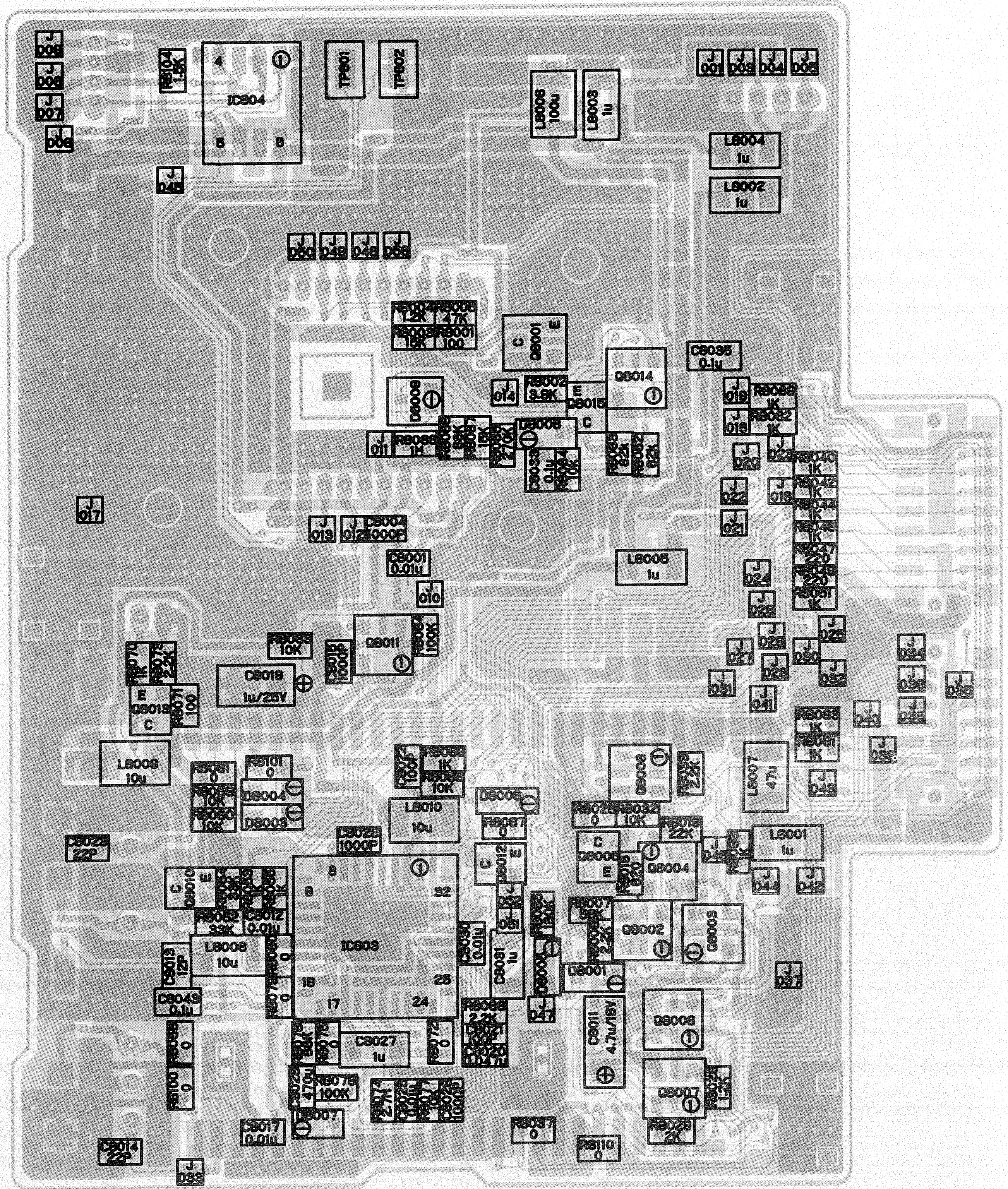
- Signal Path

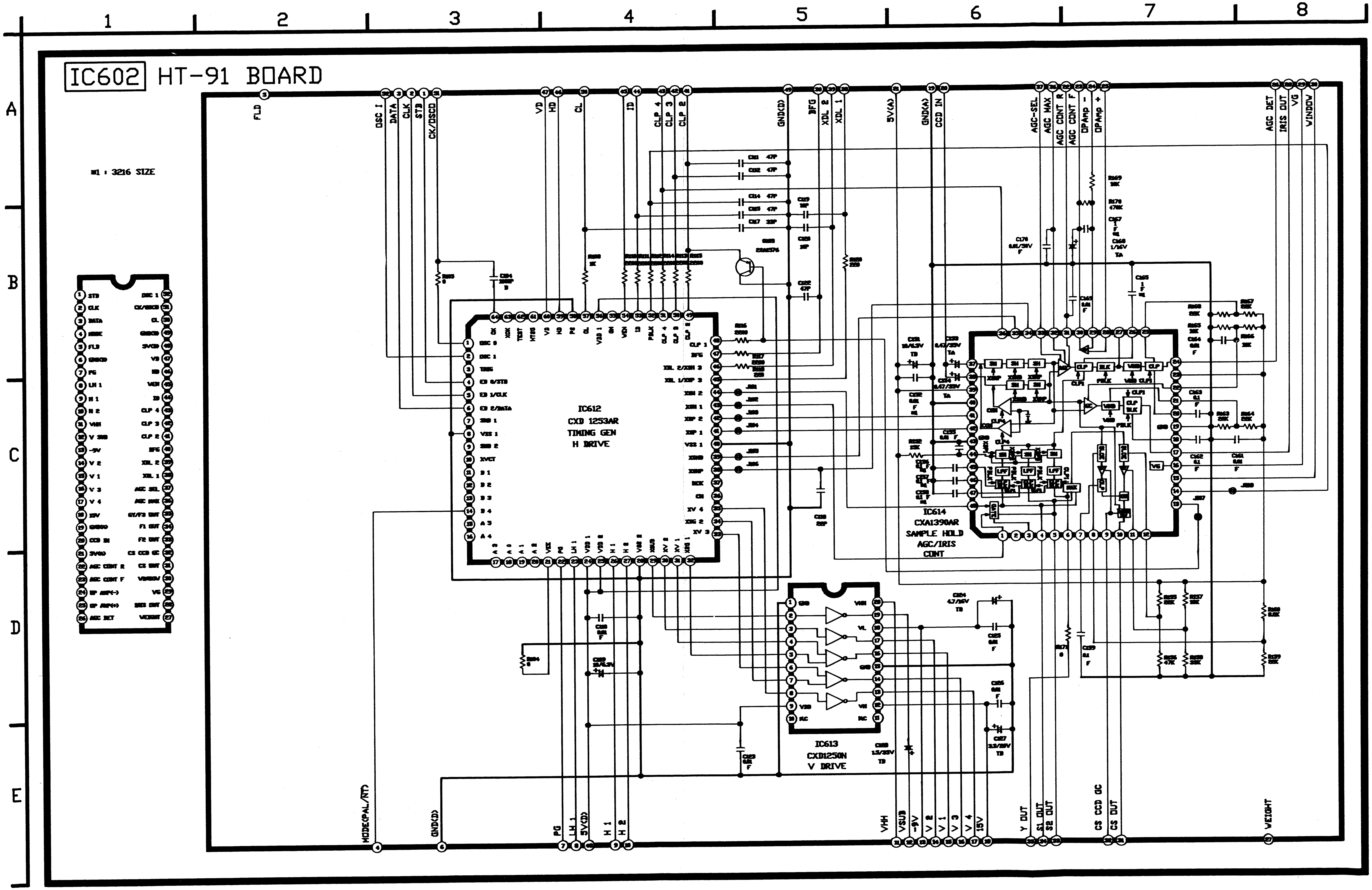
VIDEO Signal		
CHROMA	Y	Y/CHROMA
➡	⇛	⇛

- **CAD-10BD** (SIDE-A)

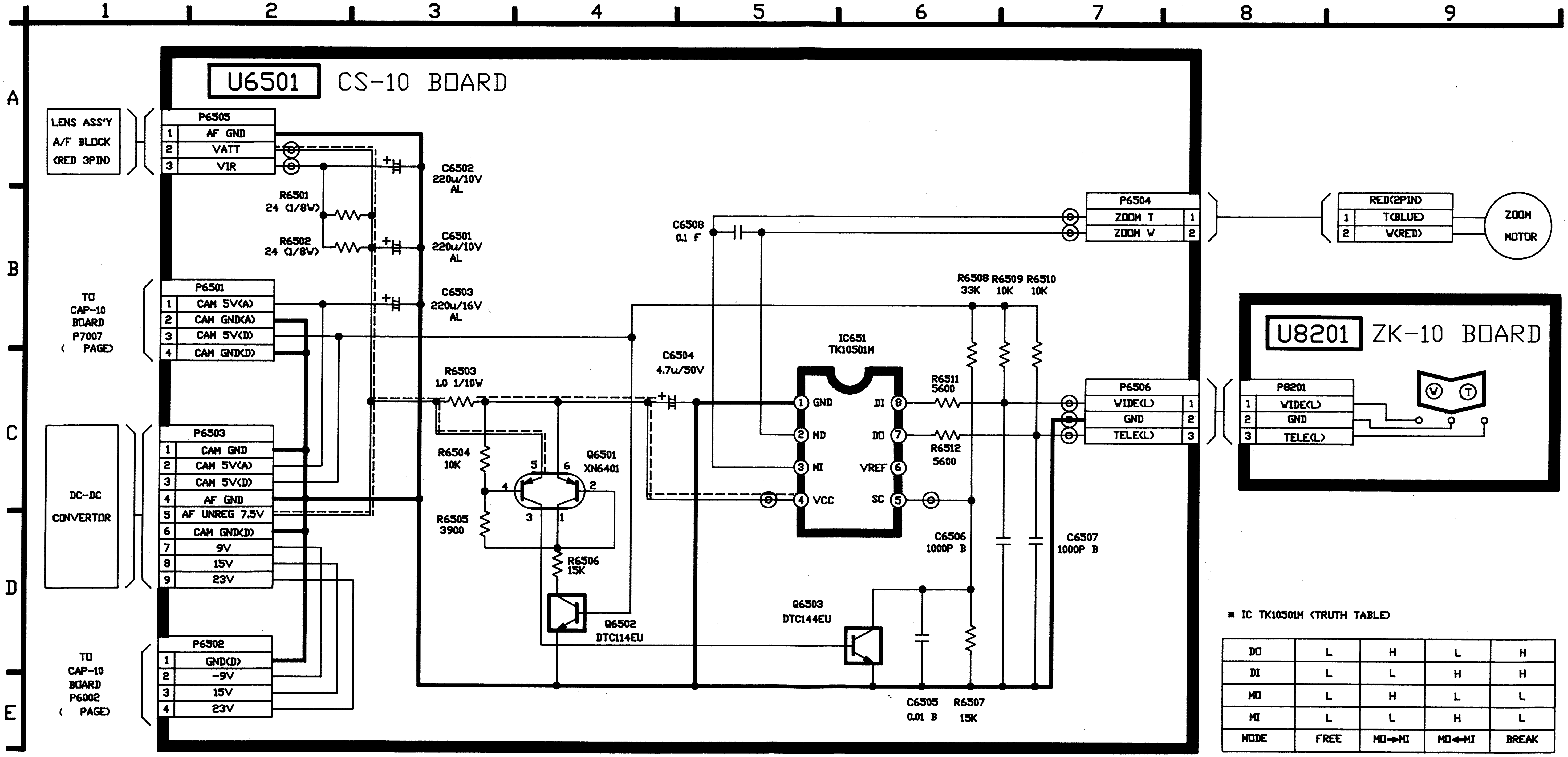

P8002
C8003 4.7u/25V
C8002 10u/35V
P8005
C8006 1u/50V
C8040 0.47u
C8041 22u/10V
C8005 33u/6.3V
IC801
10
11
20
C8034 3.3u/25V
TP803
P8003
C8008 33u/6.3V
C8010 47u/4V
P8001
C8018 100u/6.3V
P8004
R8102 1K
C8009 0.01u
C8007 6.8u/25V
R8017 33K
R8009 22K
R8008 6.2K
R8018 2.2K
R8011 6.8K
R8010 6.8K
R8012 2.2K
R8014 68K
R8024 10K
R8022 4.7K
IC802
28
27
52
X8002
CT802
TP804
X8001
CT801

- **CAD-10BD** (SIDE-B)


IC804
4
5
8
TP801
TP802
L8008 100u
L8003 1u
L8004 1u
L8002 1u
Q8001
C8035 0.1u
Q8014
L8005 1u
C8004 1000P
C8001 0.01u
Q8011
C8019 1u/25V
Q8013
L8009 10u
D8004
D8003
L8010 10u
D8006
C8028 1000P
C8029 22P
IC803
C8012 0.01u
L8006 10u
C8043 0.1u
C8027 1u
C8017 0.01u
D8007
C8014 22P
R8037 0
R8110 0
Q8006
L8007 47u
L8001 1u
Q8004
Q8002
Q8003
D8001
C8011 4.7u/16V
Q8008
Q8007
R8028 2K


IC602 HT-91 BOARD
※1 : 3216 SIZE
1
2
3
4
5
6
7
8
A
B
C
D
E
FLD
OSC I
DATA
CLK
STB
CK/OSCO
VD
HD
CL
ID
CLP 4
CLP 3
CLP 2
GND(D)
BFG
XDL 2
XDL 1
5V(A)
GND(A)
CCD IN
AGC-SEL
AGC MAX
AGC CONT R
AGC CONT F
OPAmp -
OPAmp +
AGC DET
IRIS OUT
VG
WINDOW
1 STB
2 CLK
3 DATA
4 MODE
5 FLD
6 GND(D)
7 PG
8 LH 1
9 H 1
10 H 2
11 VHH
12 V SUB
13 -9V
14 V 2
15 V 1
16 V 3
17 V 4
18 15V
19 GND(A)
20 CCD IN
21 5V(A)
22 AGC CONT R
23 AGC CONT F
24 OP AMP(-)
25 OP AMP(+)
26 AGC DET
52 OSC 1
51 CK/OSCO
50 CL
49 GND(D)
48 5V(D)
47 VD
46 HD
45 WEN
44 ID
43 CLP 4
42 CLP 3
41 CLP 2
40 BFG
39 XDL 2
38 XDL 1
37 AGC SEL
36 AGC MAX
35 GY/F3 OUT
34 F1 OUT
33 F2 OUT
32 CS CCD GC
31 CS OUT
30 WINDOW
29 VG
28 IRIS OUT
27 WEIGHT
IC612
CXD 1253AR
TIMING GEN
H DRIVE
Q602
2SA1576
IC614
CXA1390AR
SAMPLE HOLD
AGC/IRIS
CONT
IC613
CXD1250N
V DRIVE
MODE(PAL/NT)
GND(D)
PG
LH 1
5V(D)
H 1
H 2
VHH
VSUB
-9V
V 2
V 1
V 3
V 4
15V
Y OUT
S1 OUT
S2 OUT
CS CCD GC
CS OUT
WEIGHT

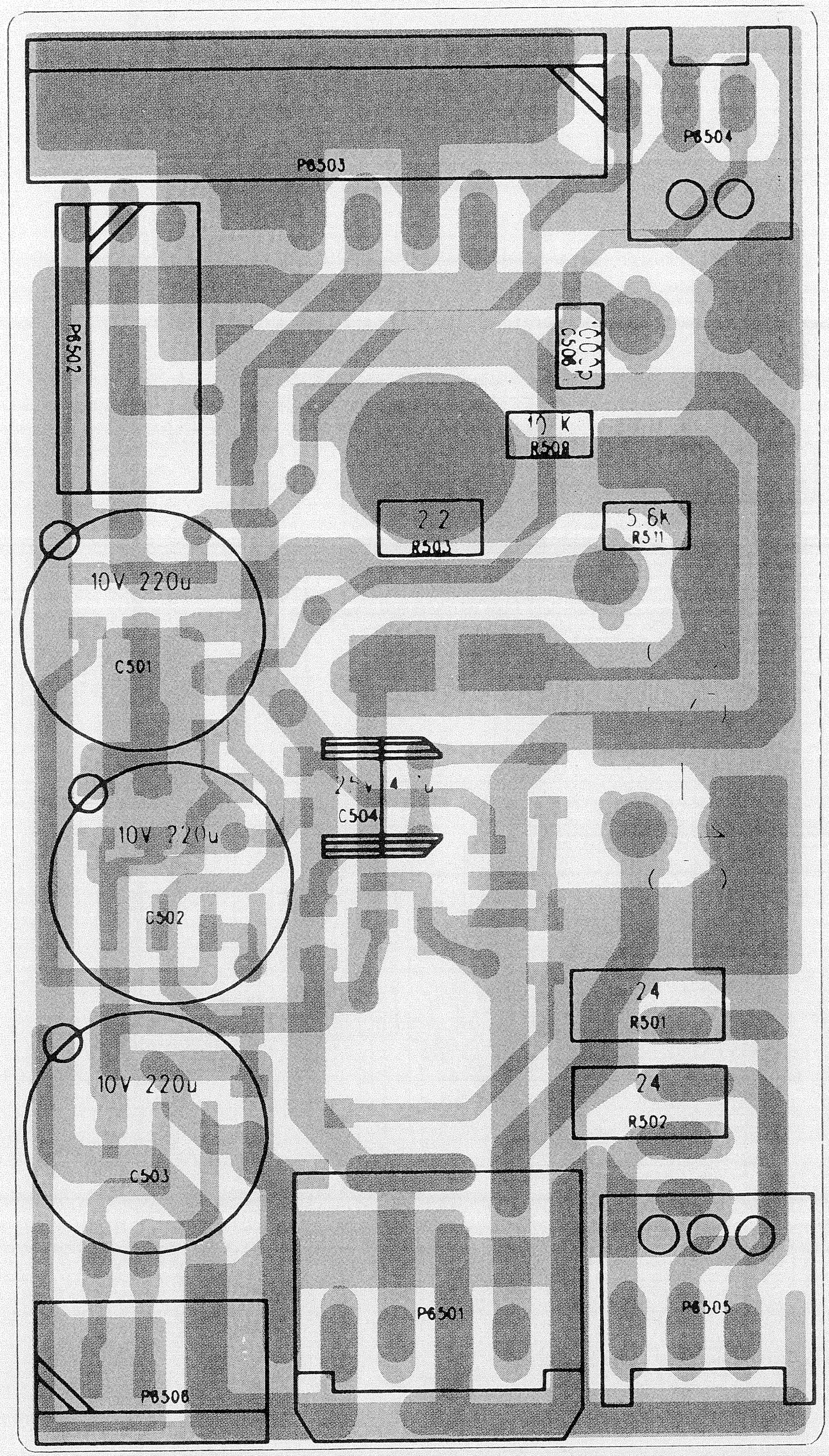
- **CS-10BD and ZK-10BD**


1
2
3
4
5
6
7
8
9
A
B
C
D
E
U6501
CS-10 BOARD
LENS ASS'Y
A/F BLOCK
(RED 3PIN)
P6505
1 AF GND
2 VATT
3 VIR
R6501
24 (1/8W)
R6502
24 (1/8W)
C6502
220u/10V
AL
C6501
220u/10V
AL
C6503
220u/16V
AL
TO
CAP-10
BOARD
P7007
(PAGE)
P6501
1 CAM 5V(A)
2 CAM GND(A)
3 CAM 5V(D)
4 CAM GND(D)
DC-DC
CONVERTOR
P6503
1 CAM GND
2 CAM 5V(A)
3 CAM 5V(D)
4 AF GND
5 AF UNREG 7.5V
6 CAM GND(D)
7 9V
8 15V
9 23V
TO
CAP-10
BOARD
P6002
(PAGE)
P6502
1 GND(D)
2 -9V
3 15V
4 23V
R6503
1.0 1/10V
R6504
10K
R6505
3900
Q6501
XN6401
R6506
15K
Q6502
DTC114EU
C6508
0.1 F
C6504
4.7u/50V
IC651
TK10501M
GND
MO
MI
VCC
DI
DO
VREF
SC
R6511
5600
R6512
5600
R6508 R6509 R6510
33K 10K 10K
C6506
1000P B
C6507
1000P B
Q6503
DTC144EU
C6505
0.01 B
R6507
15K
P6504
ZOOM T 1
ZOOM W 2
RED(2PIN)
1 T(BLUE)
2 W(RED)
ZOOM
MOTOR
P6506
WIDE(L) 1
GND 2
TELE(L) 3
U8201
ZK-10 BOARD
P8201
1 WIDE(L)
2 GND
3 TELE(L)
W
T

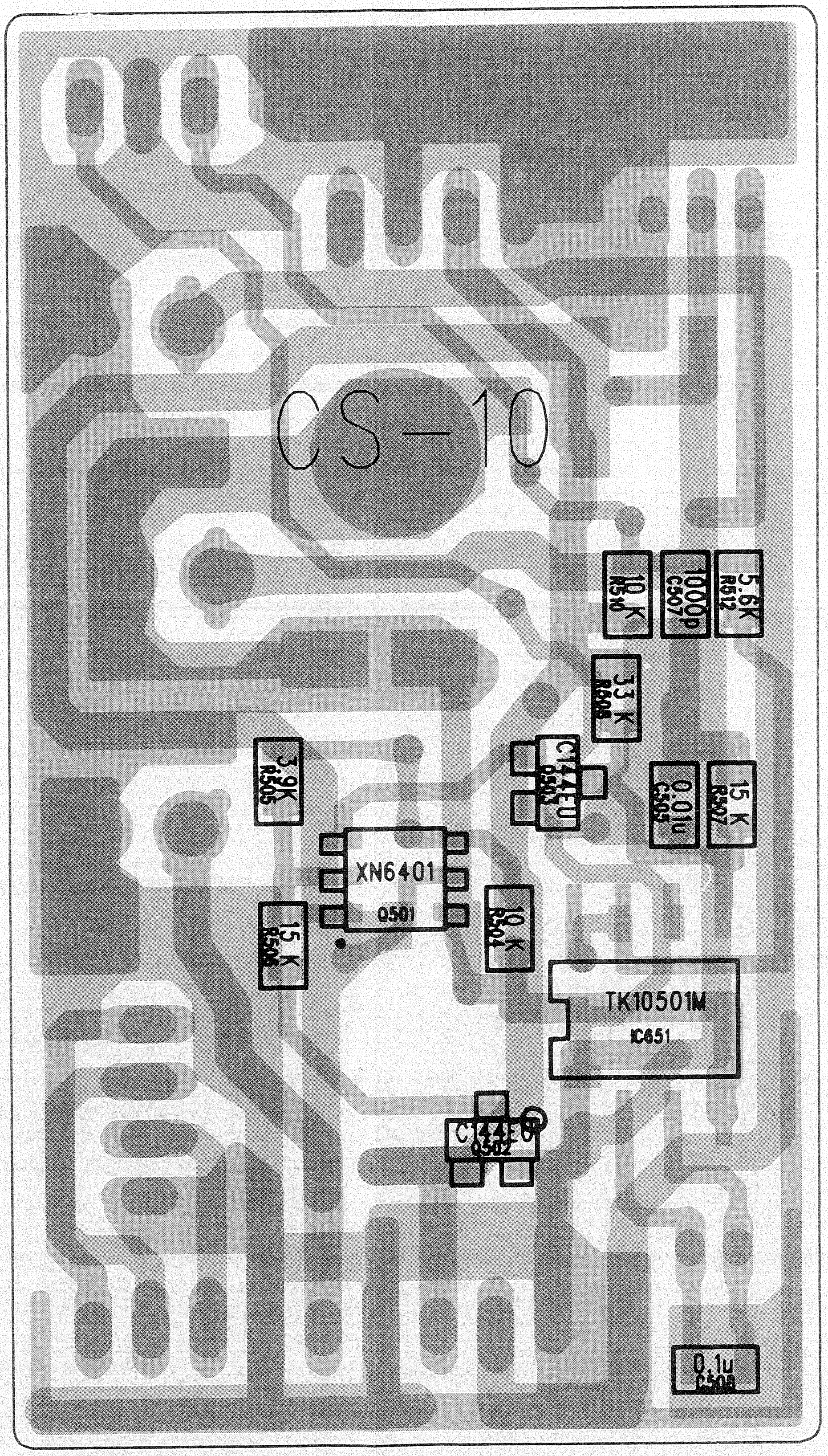
■ IC TK10501M (TRUTH TABLE)

DO	L	H	L	H
DI	L	L	H	H
MO	L	H	L	L
MI	L	L	H	L
MODE	FREE	MO→MI	MO←MI	BREAK

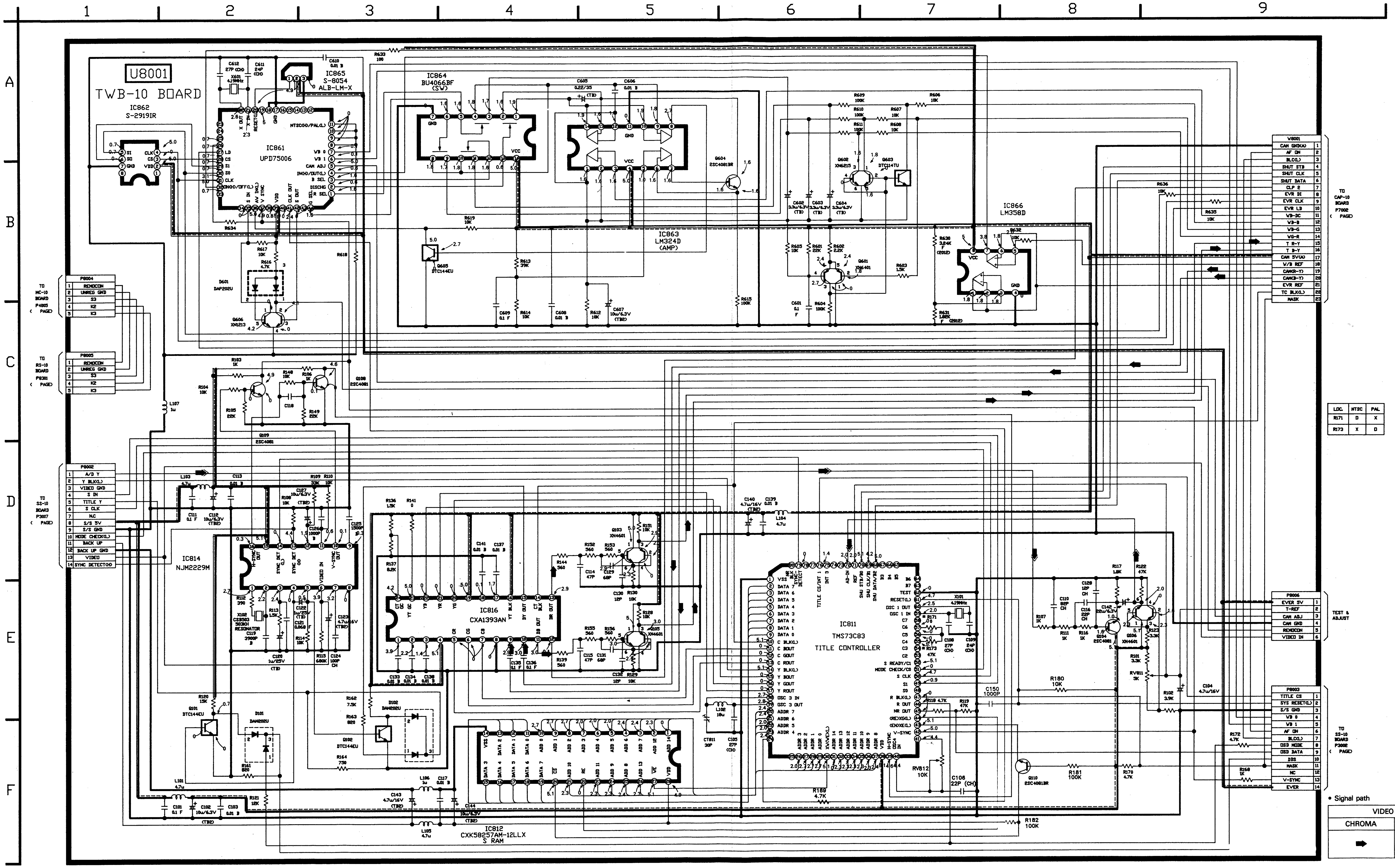
- **CS-10BD** (SIDE-A)


P6503
P6504
P6502
C506
10 K
R508
2.2
R503
5.6K
R511
10V 220u
C501
10V 220u
C502
10V 220u
C503
C504
24
R501
24
R502
P6501
P6505
P6506

- **CS-10BD** (SIDE-B)


CS-10
10 K
R510
1000p
C507
5.6K
R512
33 K
R509
C144EU
Q503
0.01u
C505
15 K
R507
3.9K
R505
XN6401
Q501
15 K
R506
10 K
R504
TK10501M
IC651
C144EU
Q502
0.1u
C508

- **TWB-10BD**

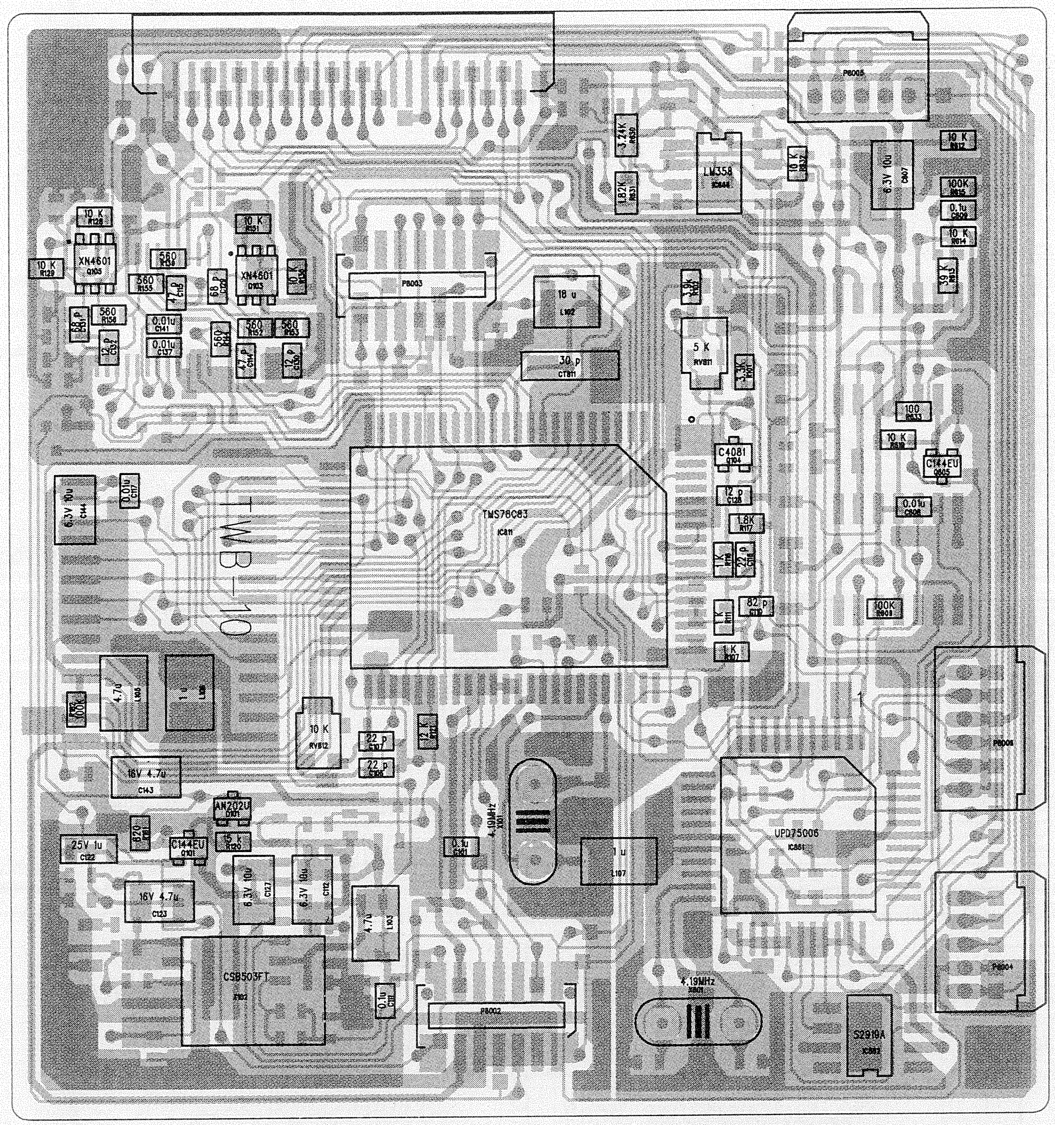

1
2
3
4
5
6
7
8
9
A
B
C
D
E
F
U8001
TWB-10 BOARD
IC862
S-2919IR
IC865
S-8054
ALB-LM-X
IC861
UPD75006
IC864
BU4066BF
(SW)
IC863
LM324D
(AMP)
IC866
LM358D
X601
4.19MHz
D601
DAP202U
Q606
XN1213
Q605
DTC144EU
Q604
2SC4081BR
Q602
XN4615
Q603
DTC114TU
Q601
XN6401
Q108
2SC4081
Q109
2SC4081
L107
1u
IC814
NJM2229M
X102
CSB503
503KHz
RESONATOR
IC816
CXA1393AN
Q103
XN4601
Q105
XN4601
IC811
TMS73C83
TITLE CONTROLLER
X101
4.19MHz
Q104
2SC4081
Q106
XN4601
RV811
5K
RV812
10K
R180
10K
R181
100K
R182
100K
C150
1000P
C108
22P (CH)
Q110
2SC4081BR
Q101
DTC144EU
D101
DAN202U
Q102
DTC144EU
D102
DAN202U
IC812
CXK58257AM-12LLX
S RAM
L103
4.7u
L104
4.7u
L105
4.7u
L106
1u
L101
4.7u
L102
10u
CT811
30P
C105
27P
R169
4.7K
R172
4.7K
R168
1K
TO
MC-10
BOARD
P4005
(PAGE)
P8004
1 REMOCON
2 UNREG GND
3 S3
4 K2
5 K3
TO
RS-10
BOARD
P8301
(PAGE)
P8005
1 REMOCON
2 UNREG GND
3 S3
4 K2
5 K3
TO
SS-10
BOARD
P3007
(PAGE)
P8002
1 A/D Y
2 Y BLK(L)
3 VIDEO GND
4 S IN
5 TITLE Y
6 S CLK
7 N.C
8 S/S 5V
9 S/S GND
10 MODE CHECK(L)
11 BACK UP
12 BACK UP GND
13 VIDEO
14 SYNC DETECT(H)
W8001
CAM GND(A) 1
AF ON 2
BLC(L) 3
SHUT STB 4
SHUT CLK 5
SHUT DATA 6
CLP 2 7
EVR DI 8
EVR CLK 9
EVR LD 10
WB-DC 11
WB-B 12
WB-G 13
WG-R 14
T R-Y 15
T B-Y 16
CAM 5V(A) 17
V/B REF 18
CAM(R-Y) 19
CAM(B-Y) 20
EVR REF 21
TC BLK(L) 22
MASK 23
TO
CAP-10
BOARD
P7002
(PAGE)
P8006
EVER 5V 1
T-REF 2
CAM ADJ 3
CAM GND 4
REMOCON 5
VIDEO IN 6
TEST &
ADJUST
P8003
TITLE CS 1
SYS RESET(L) 2
S/S GND 3
WB 0 4
WB 1 5
AF ON 6
BLC(L) 7
OSD MODE 8
OSD DATA 9
DDS 10
MASK 11
NC 12
V-SYNC 13
EVER 14
TO
SS-10
BOARD
P3002
(PAGE)

LOC.	NTSC	PAL
R171	O	X
R173	X	O

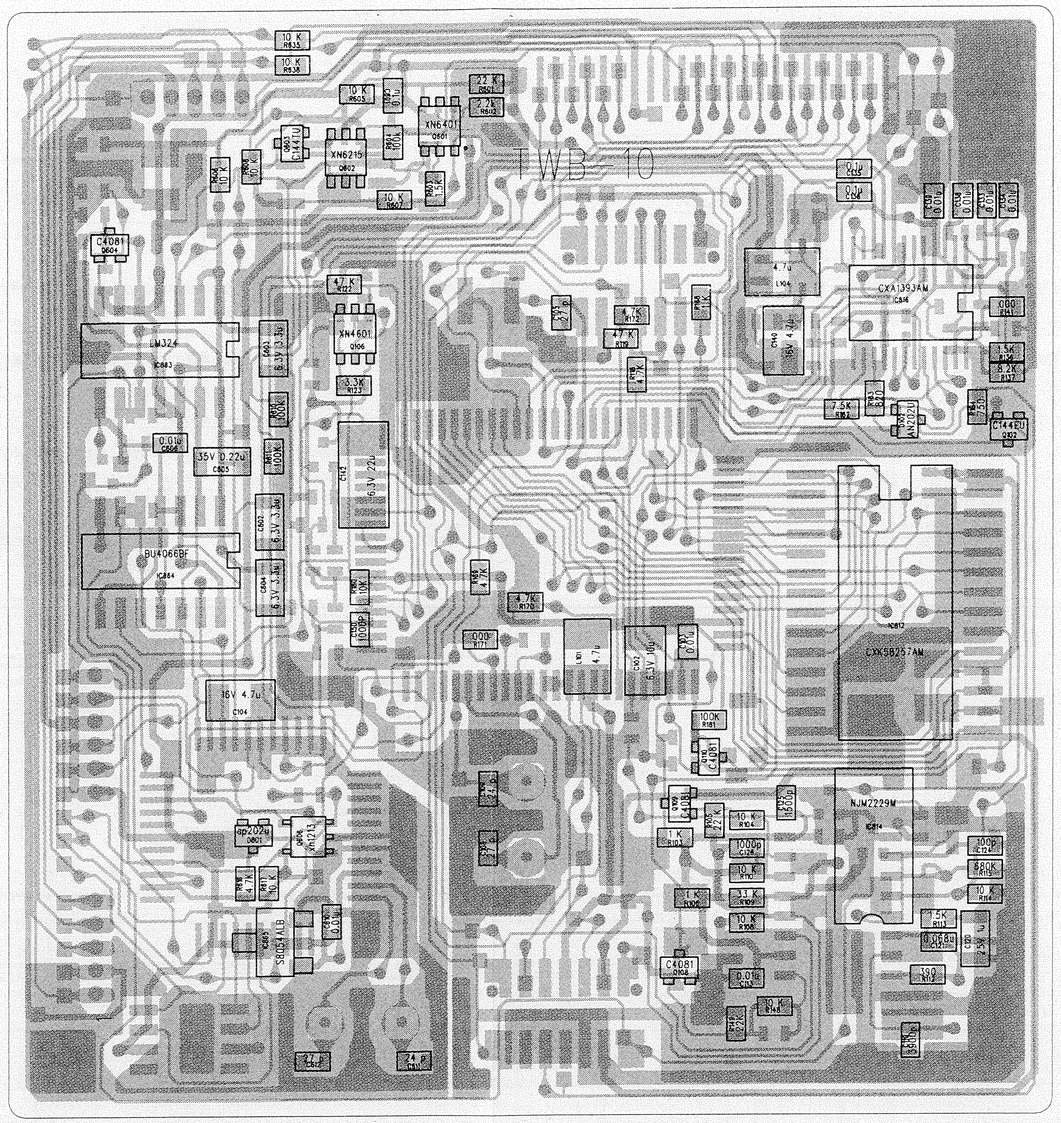
- Signal path

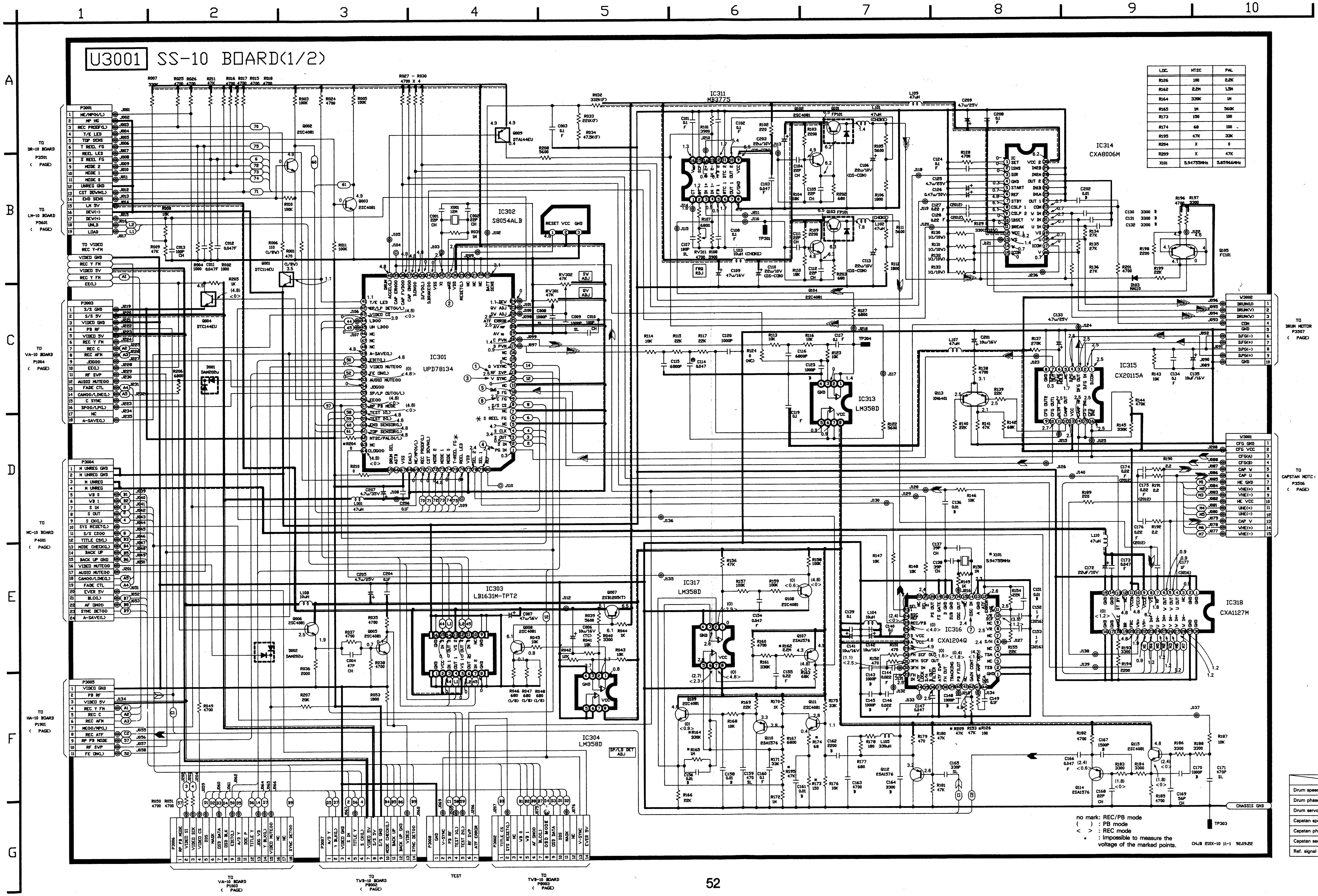
VIDEO Signal	
CHROMA	Y
➡	⇛

- **TWB-10BD** (SIDE-A)


TWB-10
TMS76C83
UPD75006
CSB503FT
S2919A
LM358
XN4601
AN2020U
C144EU
C4081
4.19MHz

- **TWB-10BD** (SIDE-B)

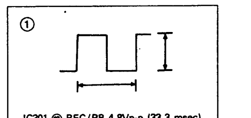

TWB-10
CXA1393AM
CXK58257AM
NJM2229M
LM324
BU4066BF
XN4601
XN6215
XN6401
C4081

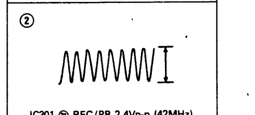

U3001 SS-10 BOARD(1/2)
IC301 UPD78134
IC302 S8054ALB
IC303 LB1631M-TPT2
IC304 LM358D
IC311 MB3775
IC313 LM358D
IC314 CXA8006M
IC315 CX20115A
IC316 CXA1204Q
IC317 LM358D
IC318 CXA1127M
TO DR-10 BOARD P3501
TO LM-10 BOARD P3601
TO VA-10 BOARD P1004
TO MC-10 BOARD P4001
TO HA-10 BOARD P1901
TO DRUM MOTOR P3507
TO CAPSTAN MOTOR P3506
TO VA-10 BOARD P1003
TO TVB-10 BOARD P8002
TEST
TO TVB-10 BOARD P8003
CHASSIS GND
TP303

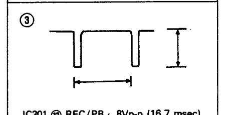
LOC.	NTSC	PAL
R126	100	2.2K
R162	2.2M	1.5M
R164	330K	1M
R165	1M	560K
R173	150	100
R174	68	100
R195	47K	33K
R204	X	0
R209	X	47K
X101	5.94755MHz	5.85966MHz

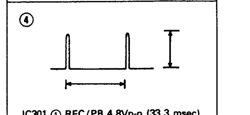
no mark: REC/PB mode
( ) : PB mode
< > : REC mode
* : Impossible to measure the voltage of the marked points.

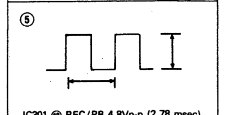
CHJB 210X-10 11-1 92.09.22

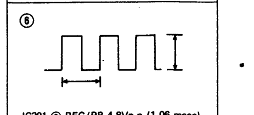

① IC301 ⑲ REC/PB 4.8Vp-p (33.3 msec)

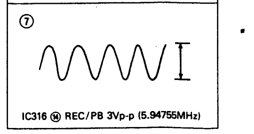

② IC301 ㉛ REC/PB 2.4Vp-p (42MHz)


③ IC301 ⑫ REC/PB 4.8Vp-p (16.7 msec)


④ IC301 ① REC/PB 4.8Vp-p (33.3 msec)

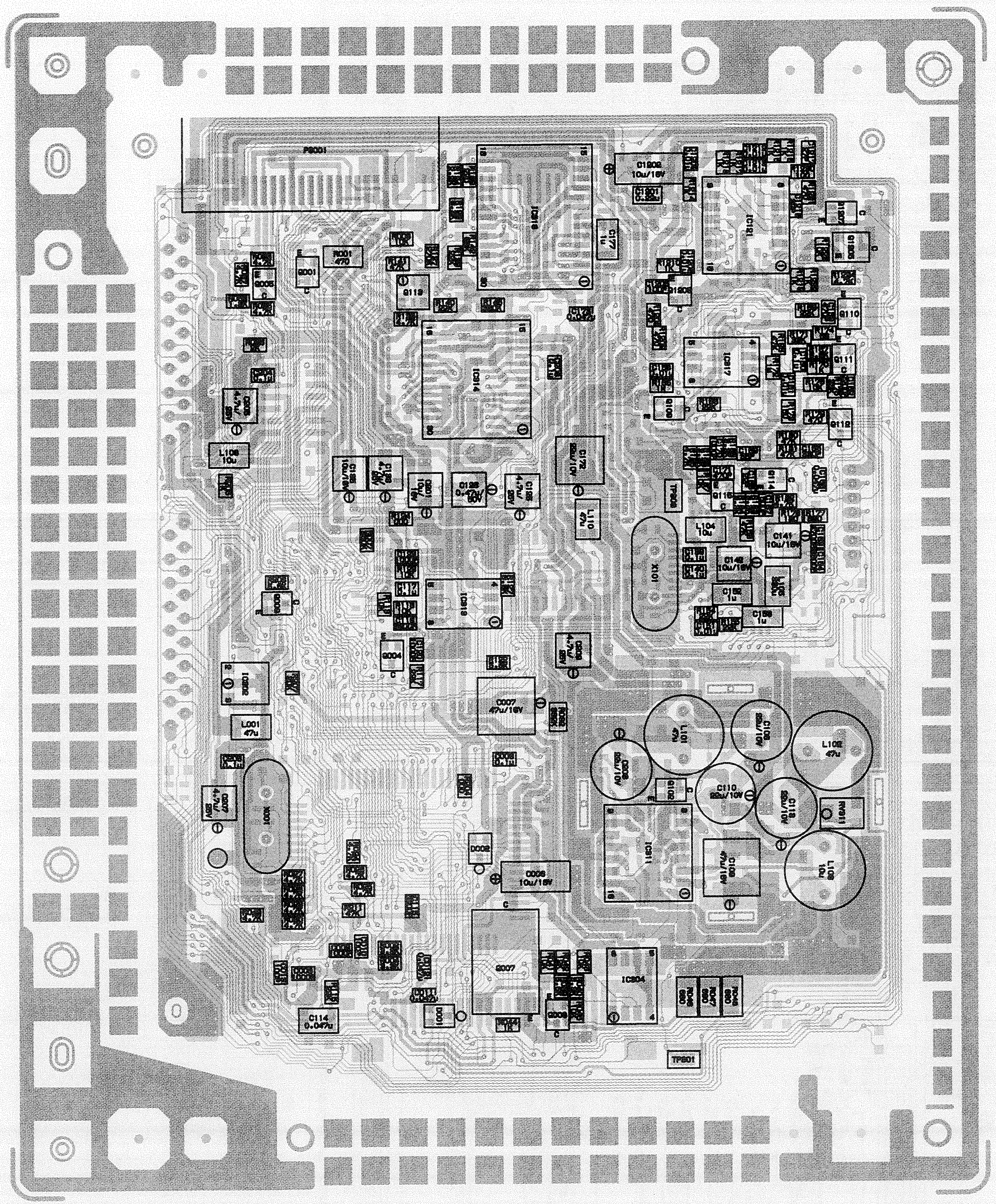

⑤ IC301 ⑩ REC/PB 4.8Vp-p (2.78 msec)


⑥ IC301 ⑨ REC/PB 4.8Vp-p (1.06 msec)

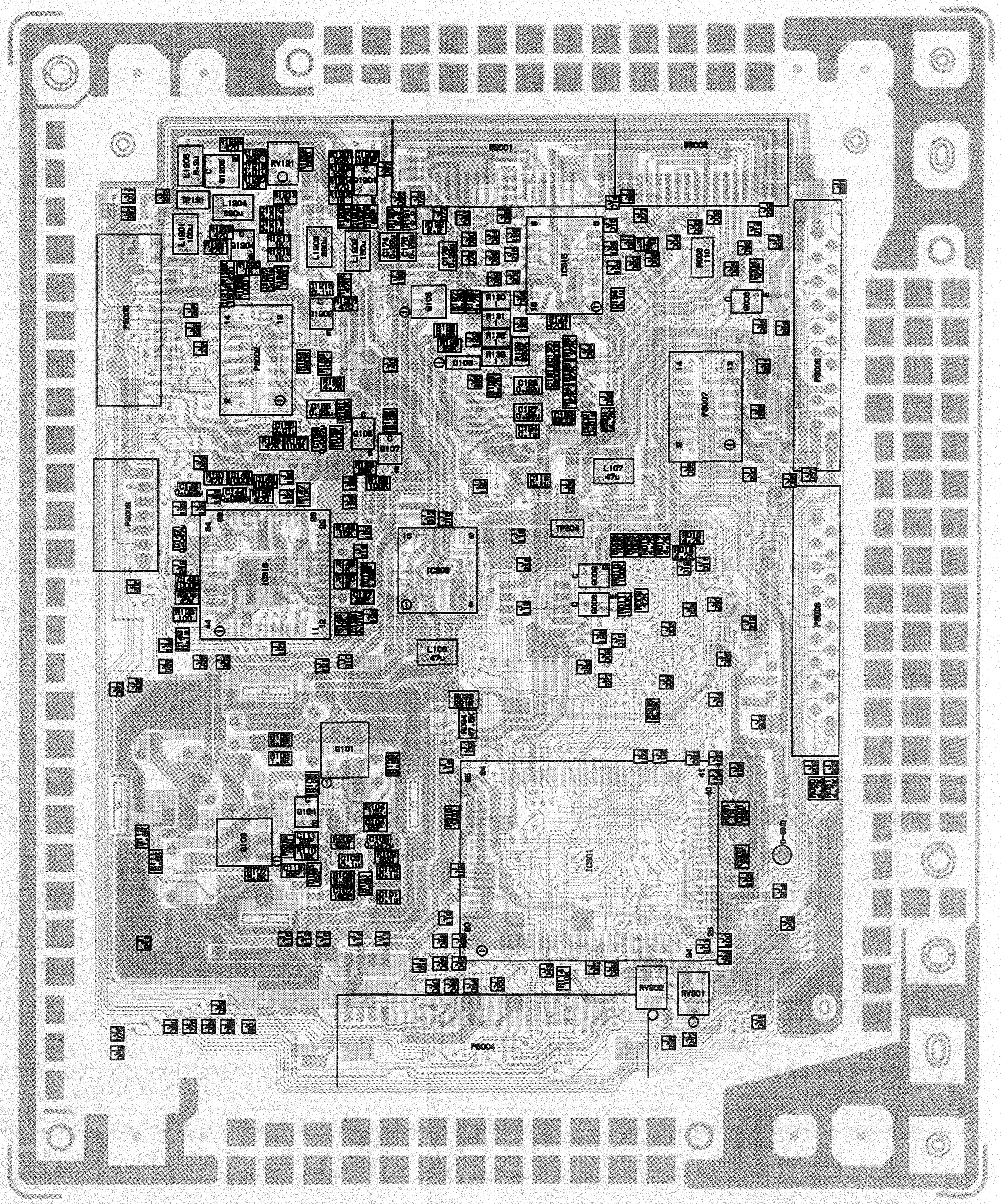

⑦ IC316 ⑭ REC/PB 3Vp-p (5.94755MHz)

	REC	REC/PB	PB
Drum speed servo		▶	
Drum phase servo		▶▶	
Drum servo (speed and phase)		▶▶▶	
Capstan speed servo		➢	
Capstan phase servo		➢➢	
Capstan servo (speed and phase)		➢➢➢	
Ref. signal	➤	➢	▷

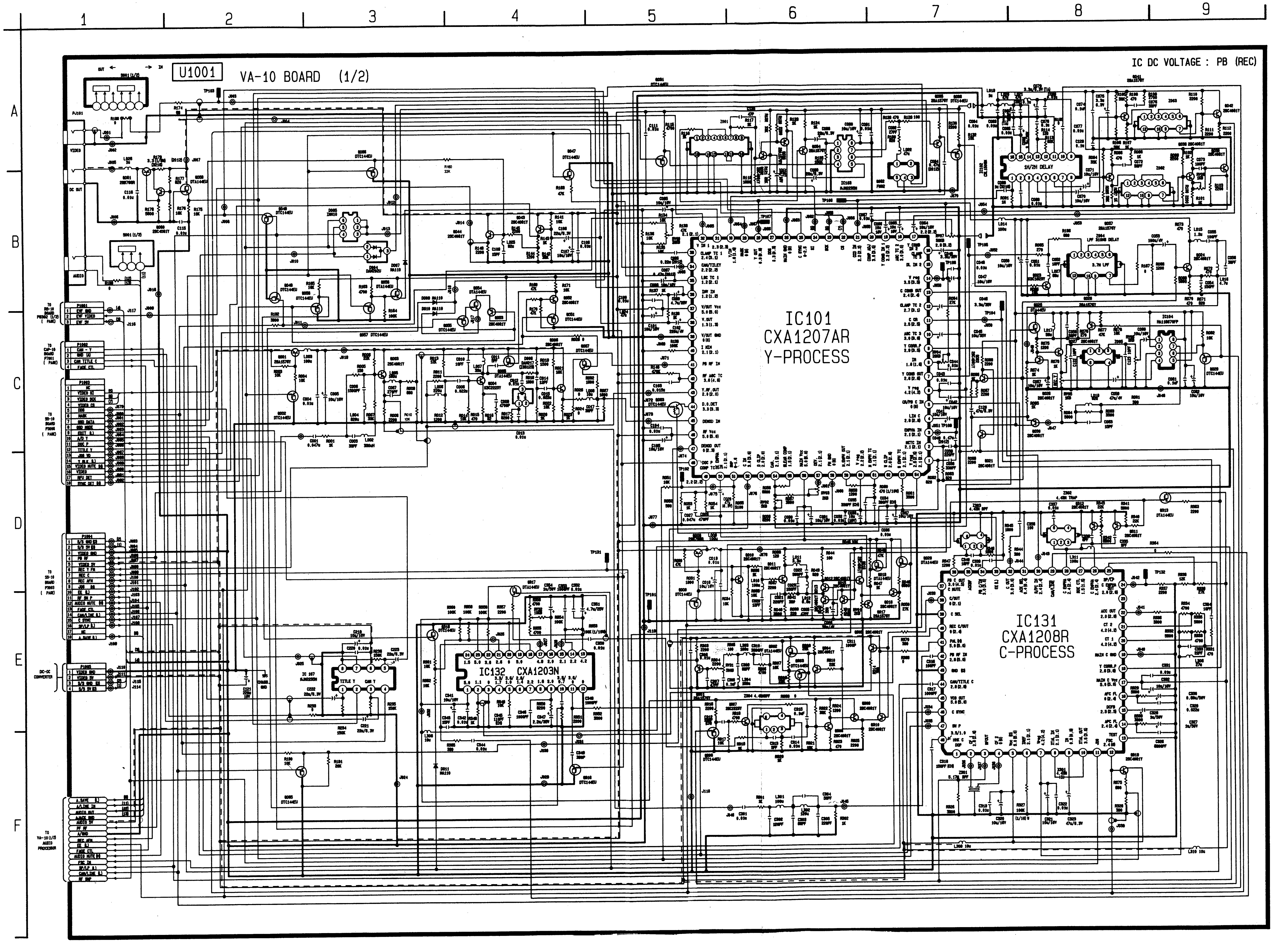
- **SS-10BD** (SIDE-A)

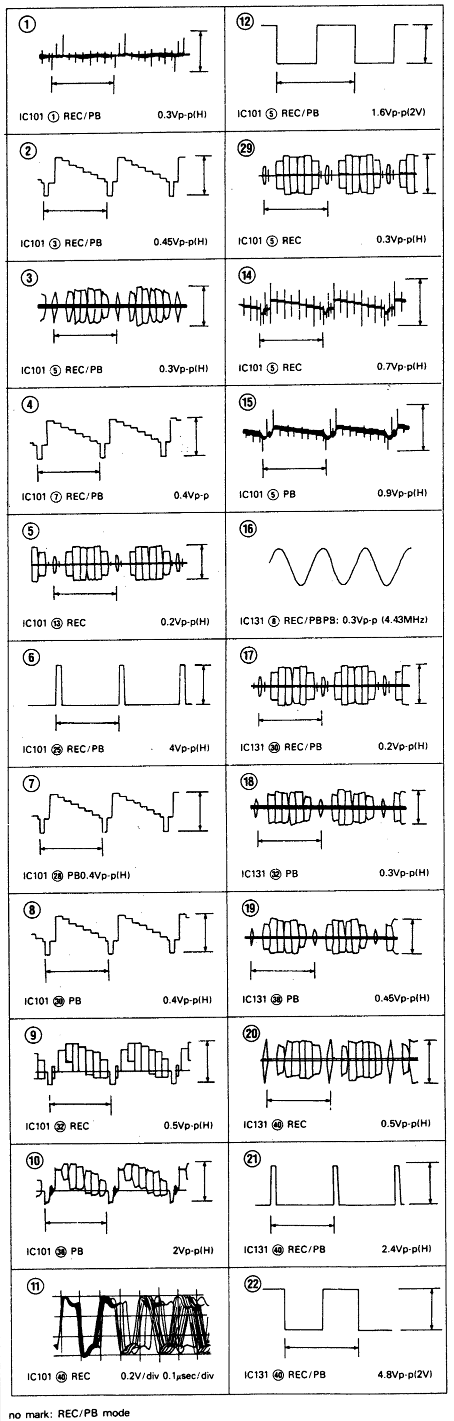


- **SS-10BD** (SIDE-B)



• Video 1/2 (VA-10BD)

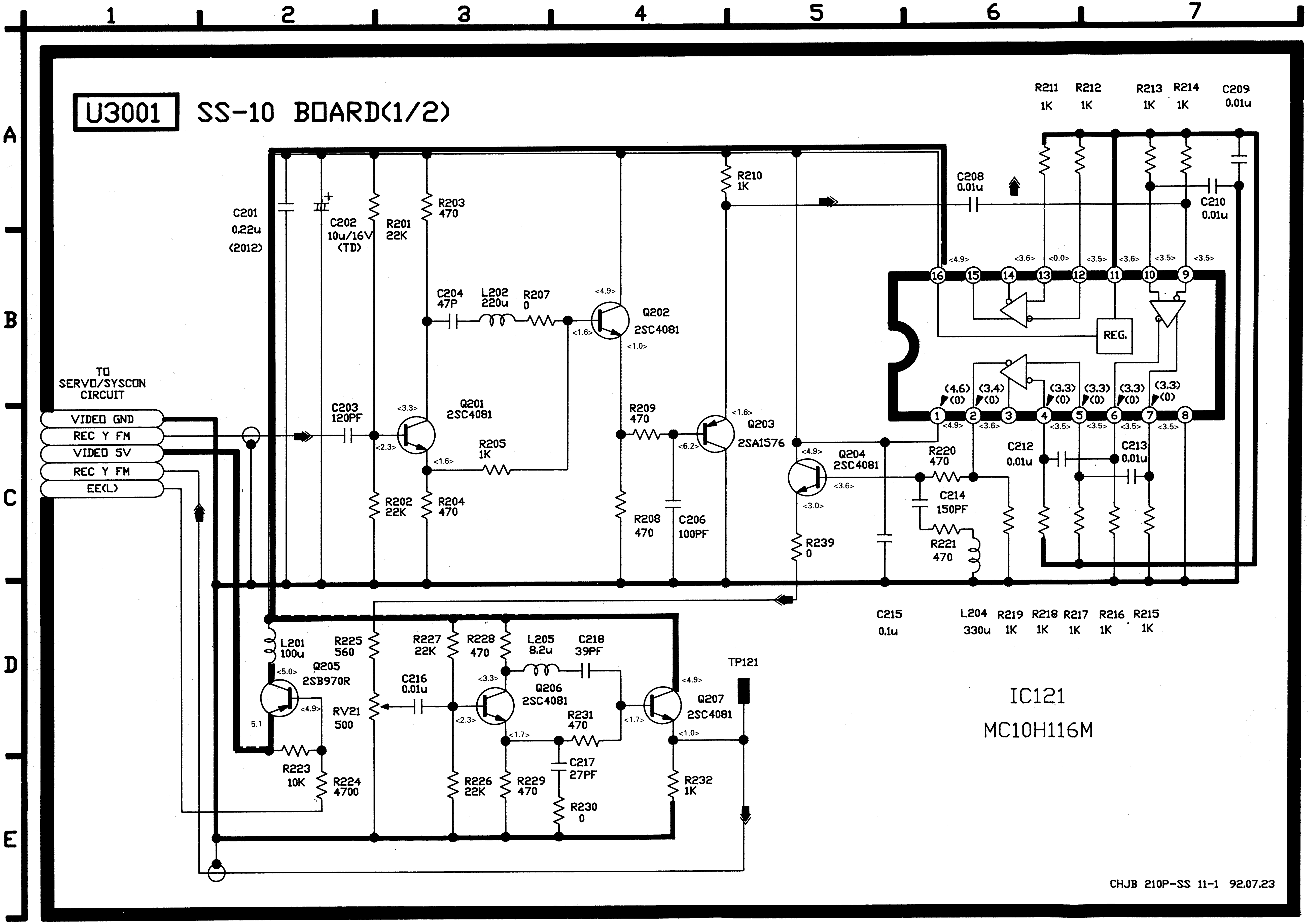

1
2
3
4
5
6
7
8
9
A
B
C
D
E
F
U1001
VA-10 BOARD (1/2)
IC DC VOLTAGE : PB (REC)
IC101
CXA1207AR
Y-PROCESS
IC131
CXA1208R
C-PROCESS
IC132 CXA1203N
1H/2H DELAY
TITLE Y
CAN Y
DC-DC CONVERTER



no mark: REC/PB mode
( ) : PB mode
< > : REC mode

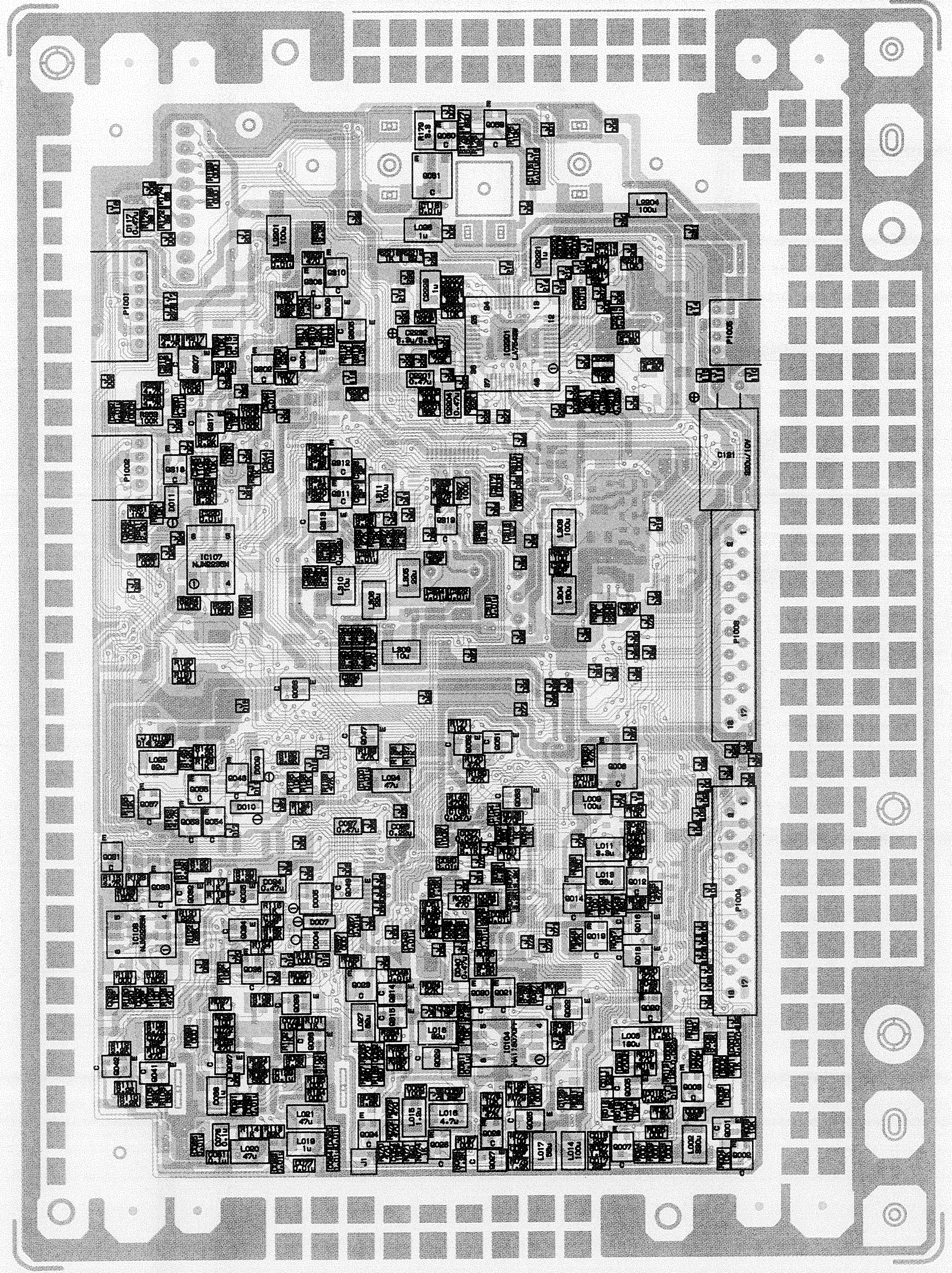
• Signal path

	VIDEO Signal		
	CHROMA	Y	Y CHROMA
REC	➡	➡	➡
PB	⇨	⇨	⇨

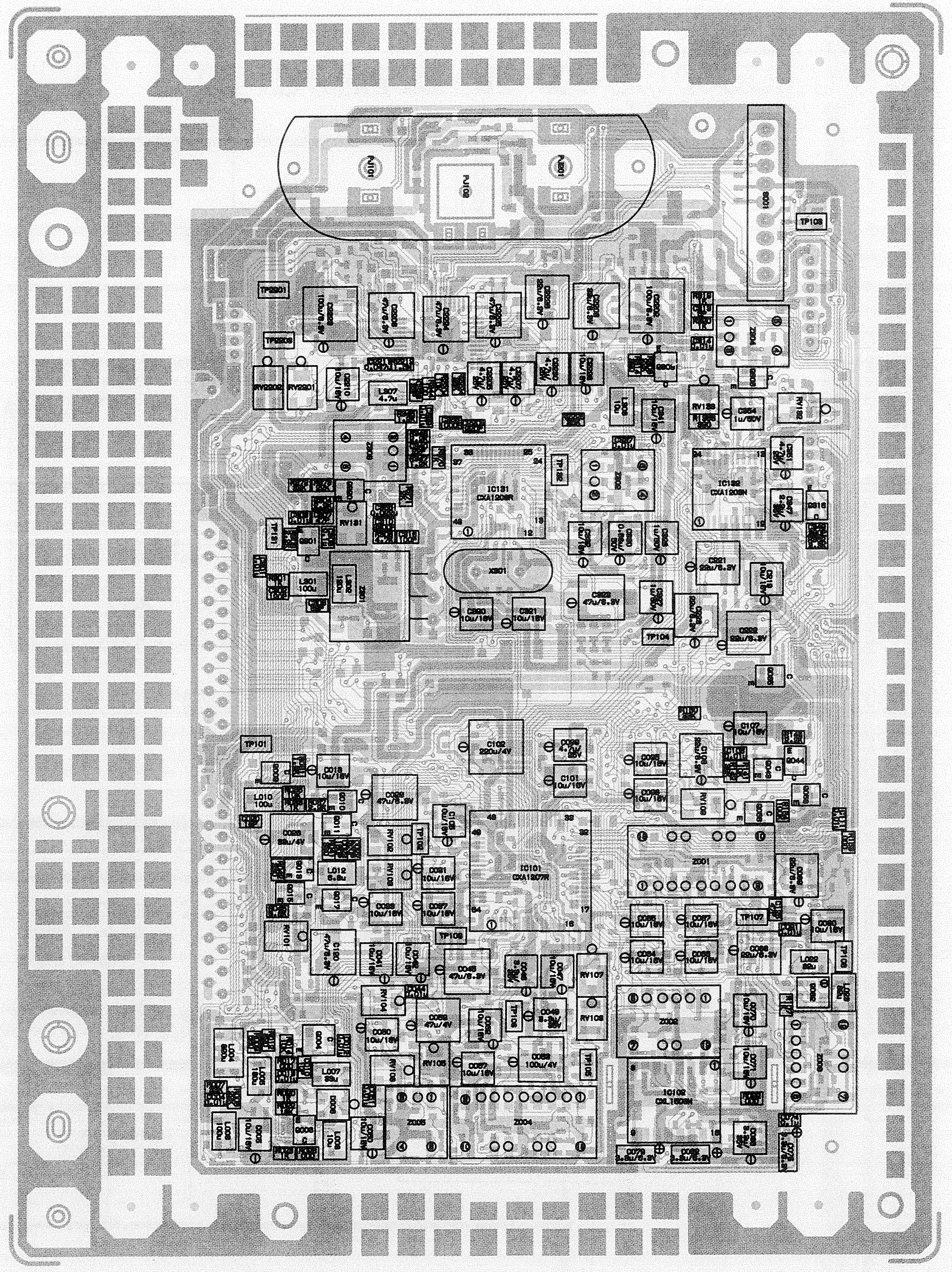

1
2
3
4
5
6
7
A
B
C
D
E
U3001
SS-10 BOARD(1/2)
TO SERVO/SYSCON CIRCUIT
VIDEO GND
REC Y FM
VIDEO 5V
REC Y FM
EE(L)
C201 0.22u (2012)
C202 10u/16V (TD)
R201 22K
R203 470
C204 47P
L202 220u
R207 0
Q202 2SC4081
C203 120PF
Q201 2SC4081
R205 1K
R202 22K
R204 470
R209 470
Q203 2SA1576
R208 470
C206 100PF
R210 1K
R239 0
Q204 2SC4081
C208 0.01u
R211 1K
R212 1K
R213 1K
R214 1K
C209 0.01u
C210 0.01u
REG.
R220 470
C214 150PF
R221 470
C212 0.01u
C213 0.01u
C215 0.1u
L204 330u
R219 1K
R218 1K
R217 1K
R216 1K
R215 1K
L201 100u
R225 560
Q205 2SB970R
RV21 500
R223 10K
R224 4700
R227 22K
R228 470
C216 0.01u
Q206 2SC4081
L205 8.2u
C218 39PF
R231 470
C217 27PF
R226 22K
R229 470
R230 0
Q207 2SC4081
R232 1K
TP121
IC121
MC10H116M
CHJB 210P-SS 11-1 92.07.23

< > REC Mode
• Signal path
REC Y: ➡

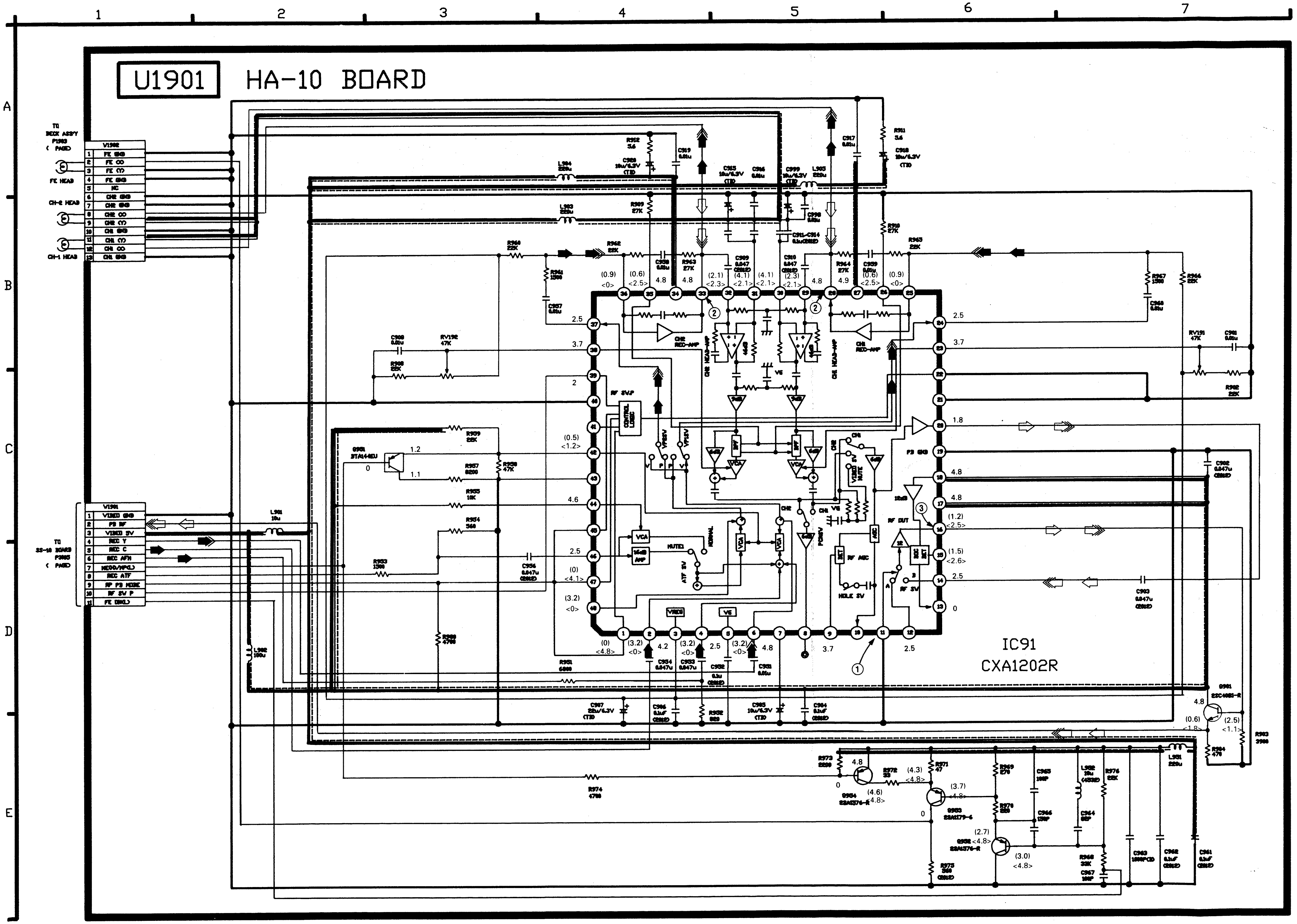
- **Video 1/2 (VA-10BD)** (SIDE-A)



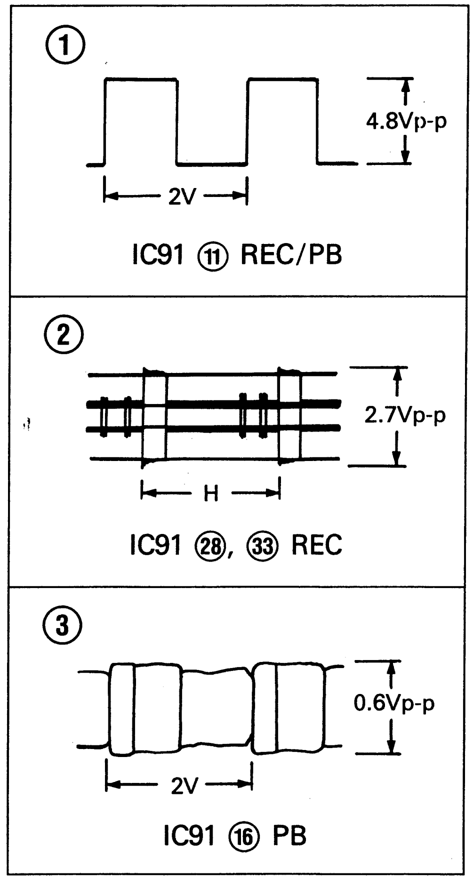
- **Video 1/2 (VA-10BD)** (SIDE-B)



• **HA-10BD**


1
2
3
4
5
6
7
A
B
C
D
E
U1901
HA-10 BOARD
TO
DECK ASS'Y
P1903
(PAGE)
V1902
1 FE GND
2 FE CO
3 FE (Y)
4 FE GND
5 NC
6 CH2 GND
7 CH2 GND
8 CH2 CO
9 CH2 (Y)
10 CH1 GND
11 CH1 (Y)
12 CH1 CO
13 CH1 GND
FE HEAD
CH-2 HEAD
CH-1 HEAD
TO
SS-10 BOARD
P3005
(PAGE)
V1901
1 VIDEO GND
2 PB RF
3 VIDEO 5V
4 REC Y
5 REC C
6 REC AFM
7 NEOD/NP(L)
8 REC ATF
9 RP PB MODE
10 RF 5V P
11 FE ON(L)
CONTROL LOGIC
CH2 REC-AMP
CH2 HEAD-AMP
CH1 HEAD-AMP
CH1 REC-AMP
VCA
16dB AMP
MUTE1
NORMAL
ATF 5V
RF AGC
HOLE SW
RF SW
VIDEO MUTE
PB GND
RF OUT
REC DET
VREG
VS
Q901
DTA144EU
IC91
CXA1202R

HA-10 BOARD (RP/FE)

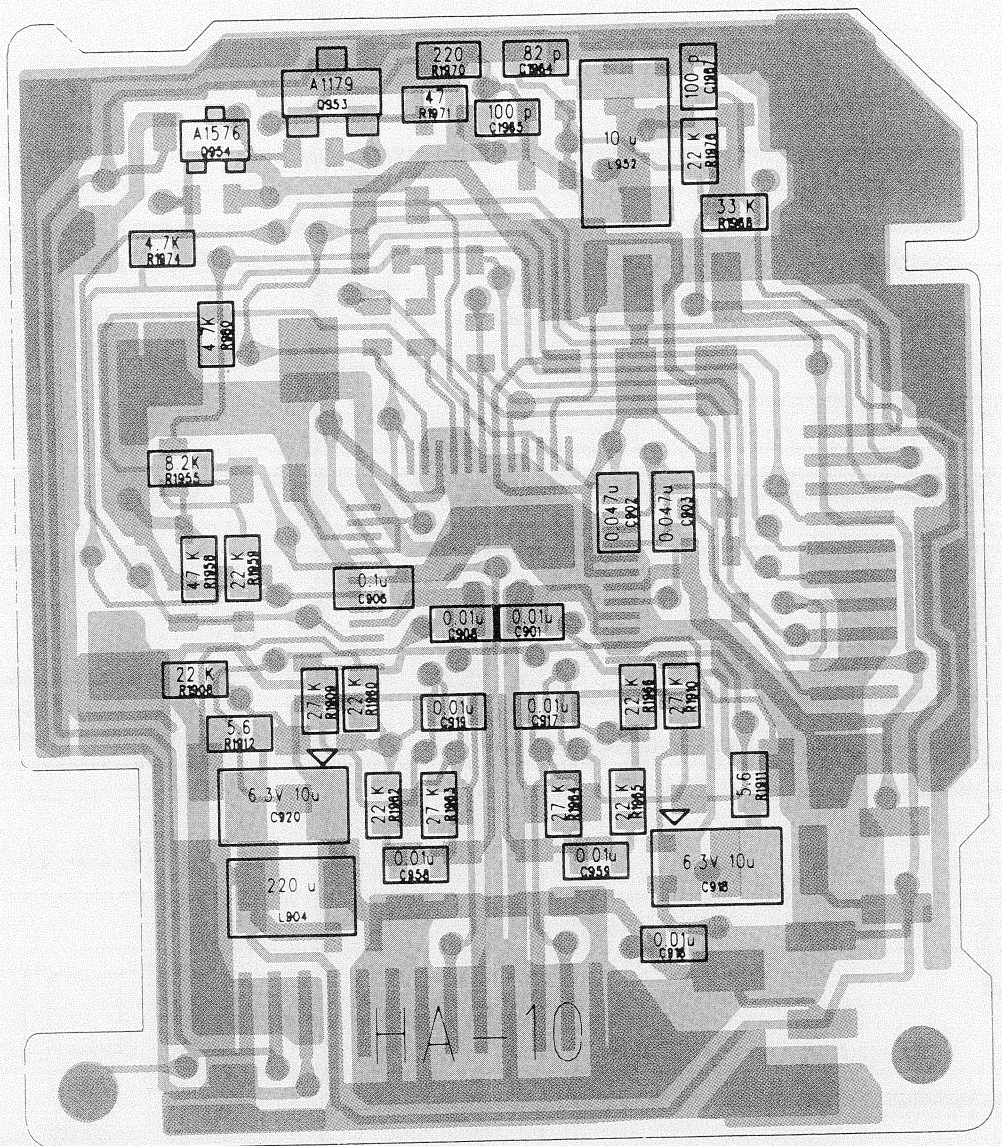

①
4.8Vp-p
2V
IC91 ⑪ REC/PB
②
2.7Vp-p
H
IC91 ㉘, ㉝ REC
③
0.6Vp-p
2V
IC91 ⑯ PB

no mark: REC PB MODE
( ) : REC MODE
< > : PB MODE

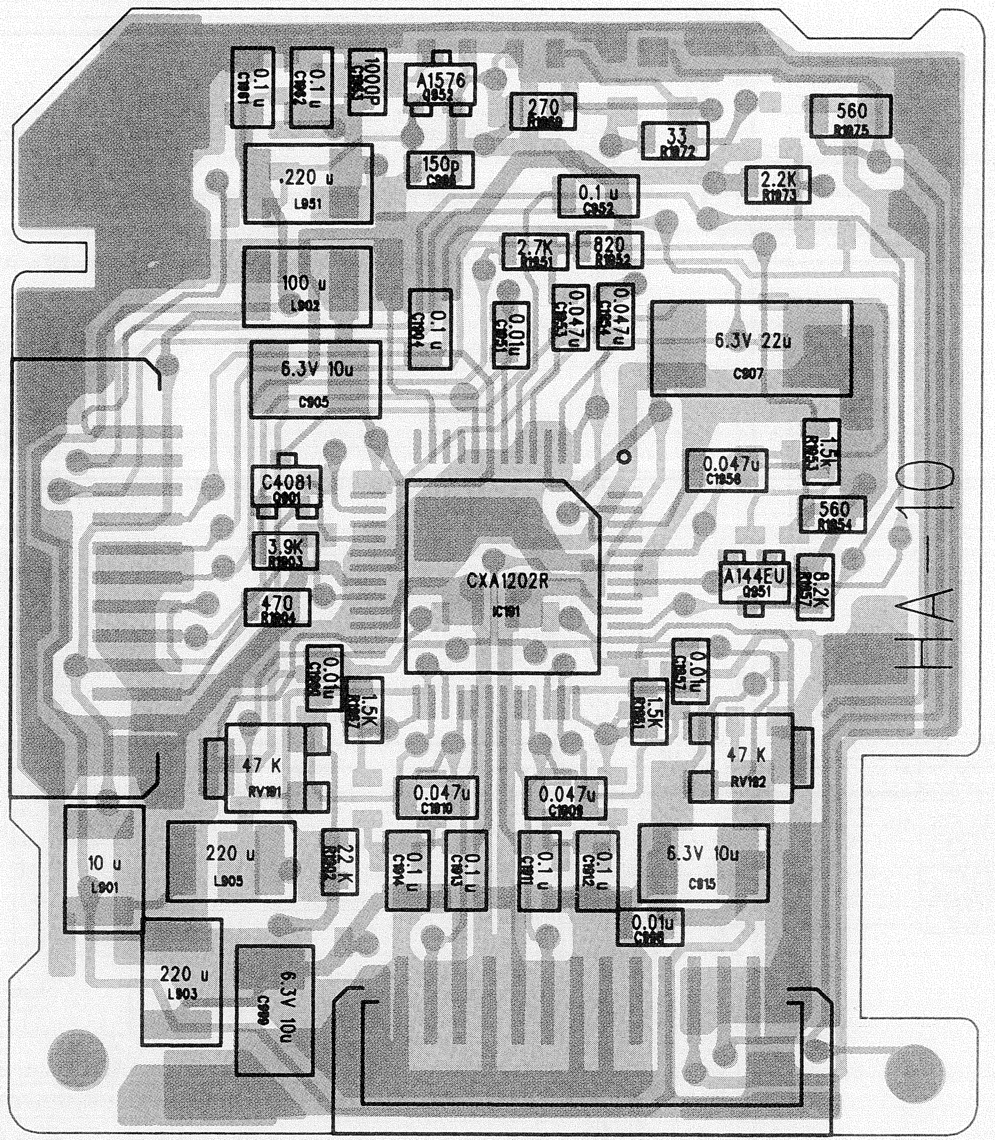
- Signal path

	VIDEO Signal			AUDIO Signal
	CHROMA	Y	Y/CHROMA	
REC	➡	➡>	➡>>	➡
PB	⇨	⇨>	⇨>>	⇨

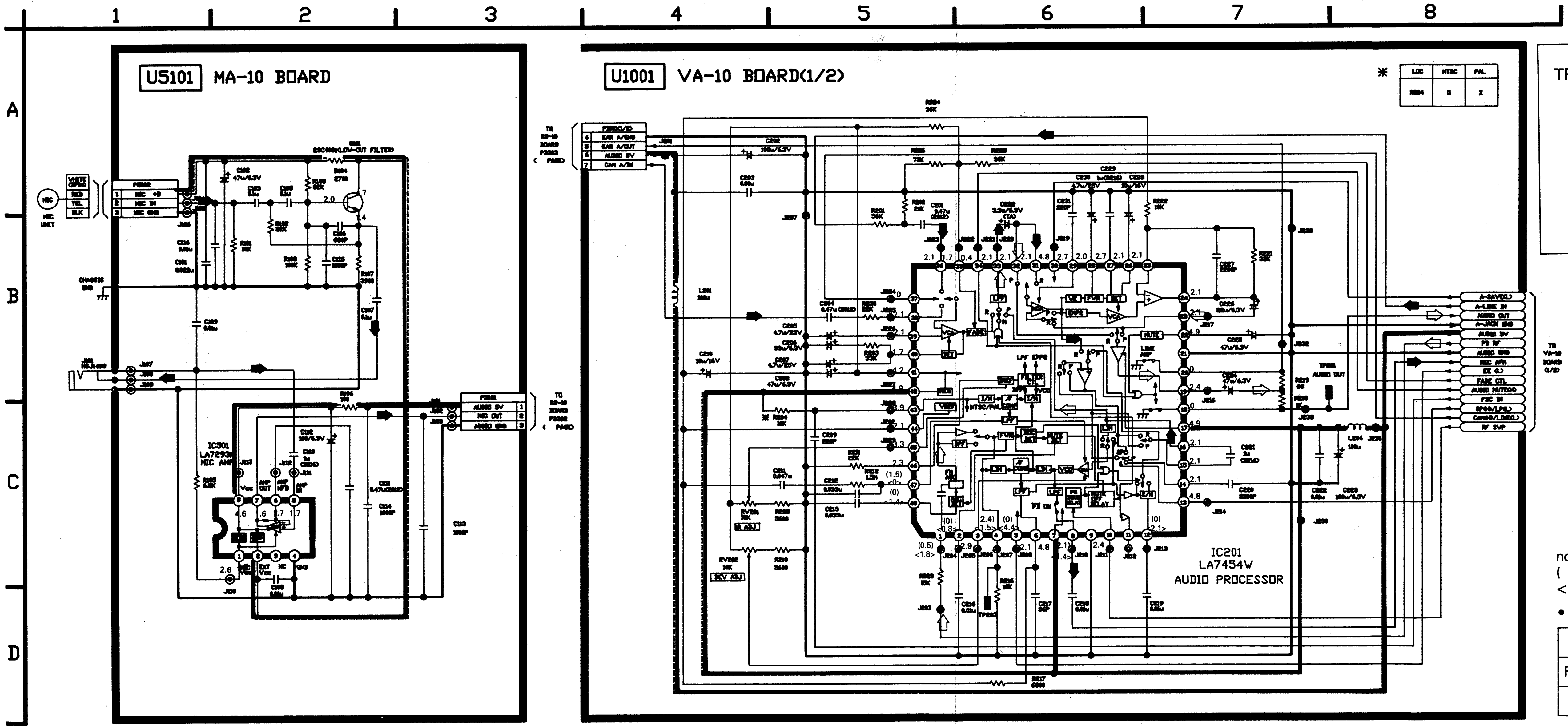
- **HA-10BD** (SIDE-A)

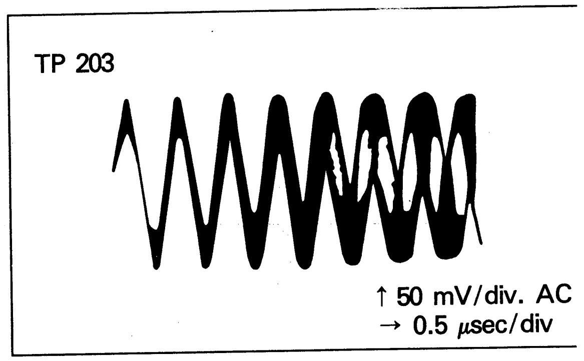

A1179
Q953
220
R1970
82 p
C1964
100 p
A1576
Q954
47
R1971
100 p
C1965
10 u
L952
22 K
33 K
R1968
4.7K
R1974
4.7K
8.2K
R1955
47 K
22 K
0.1u
C906
0.047u
C902
0.047u
C903
0.01u
C905
0.01u
C901
22 K
5.6
27 K
22 K
0.01u
0.01u
22 K
27 K
6.3V 10u
C920
22 K
27 K
27 K
22 K
5.6
220 u
L904
0.01u
0.01u
6.3V 10u
C918
0.01u
HA-10

- **HA-10BD** (SIDE-B)


0.1 u
0.1 u
1000P
A1576
Q952
270
560
R1975
33
R1972
2.2K
R1973
220 u
L951
150p
0.1 u
C952
2.7K
820
100 u
L902
0.1 u
0.01u
0.047u
0.047u
6.3V 22u
C907
6.3V 10u
C905
C4081
Q901
1.5K
0.047u
560
3.9K
CXA1202R
IC101
A144EU
Q951
8.2K
470
0.01u
1.5K
1.5K
0.01u
47 K
RV101
47 K
RV102
0.047u
0.047u
10 u
L901
220 u
L905
22 K
0.1 u
0.1 u
0.1 u
0.1 u
6.3V 10u
C915
0.01u
220 u
L903
6.3V 10u
HA-10

- **Audio and MA-10BD**


1
2
3
4
5
6
7
8
A
B
C
D
U5101 MA-10 BOARD
U1001 VA-10 BOARD(1/2)
IC501
LA7293W
MIC AMP
IC201
LA7454W
AUDIO PROCESSOR

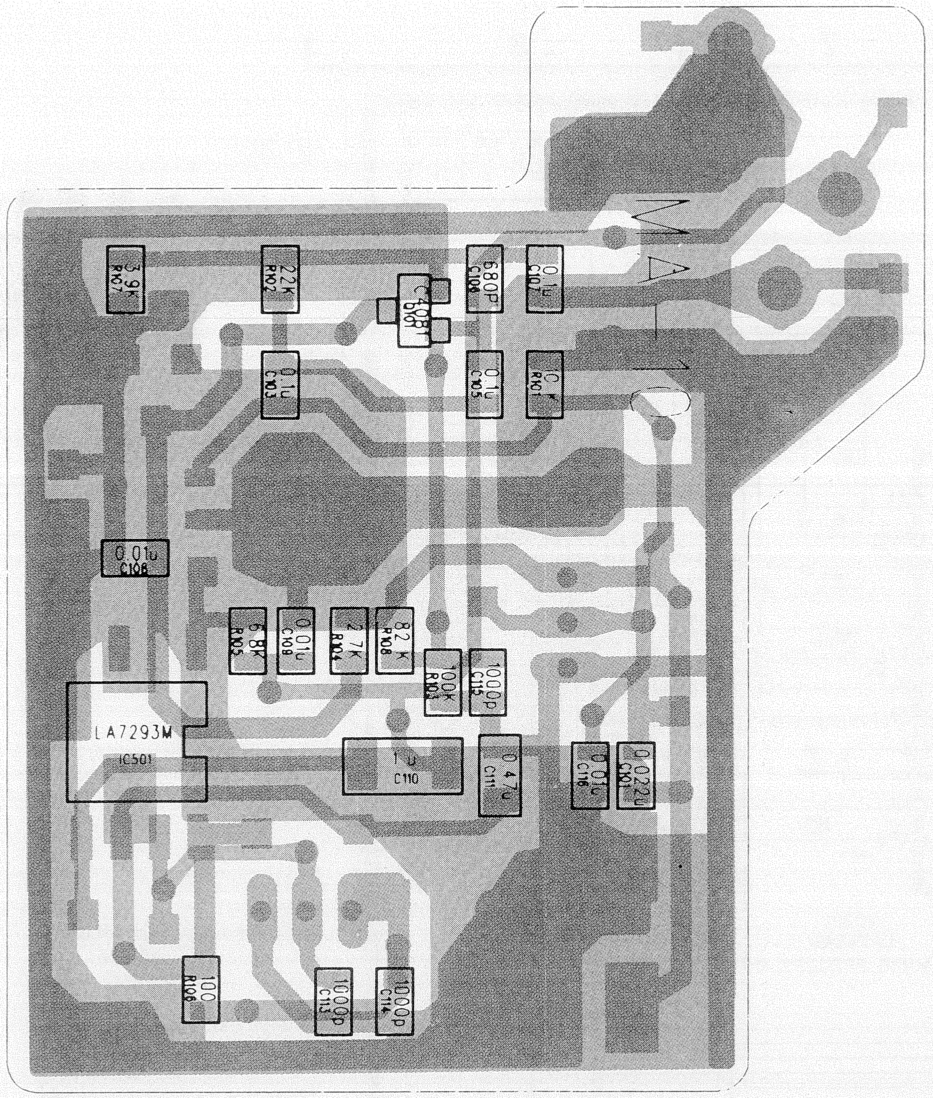


no mark: REC PB MODE
( ) : REC MODE
< > : PB MODE

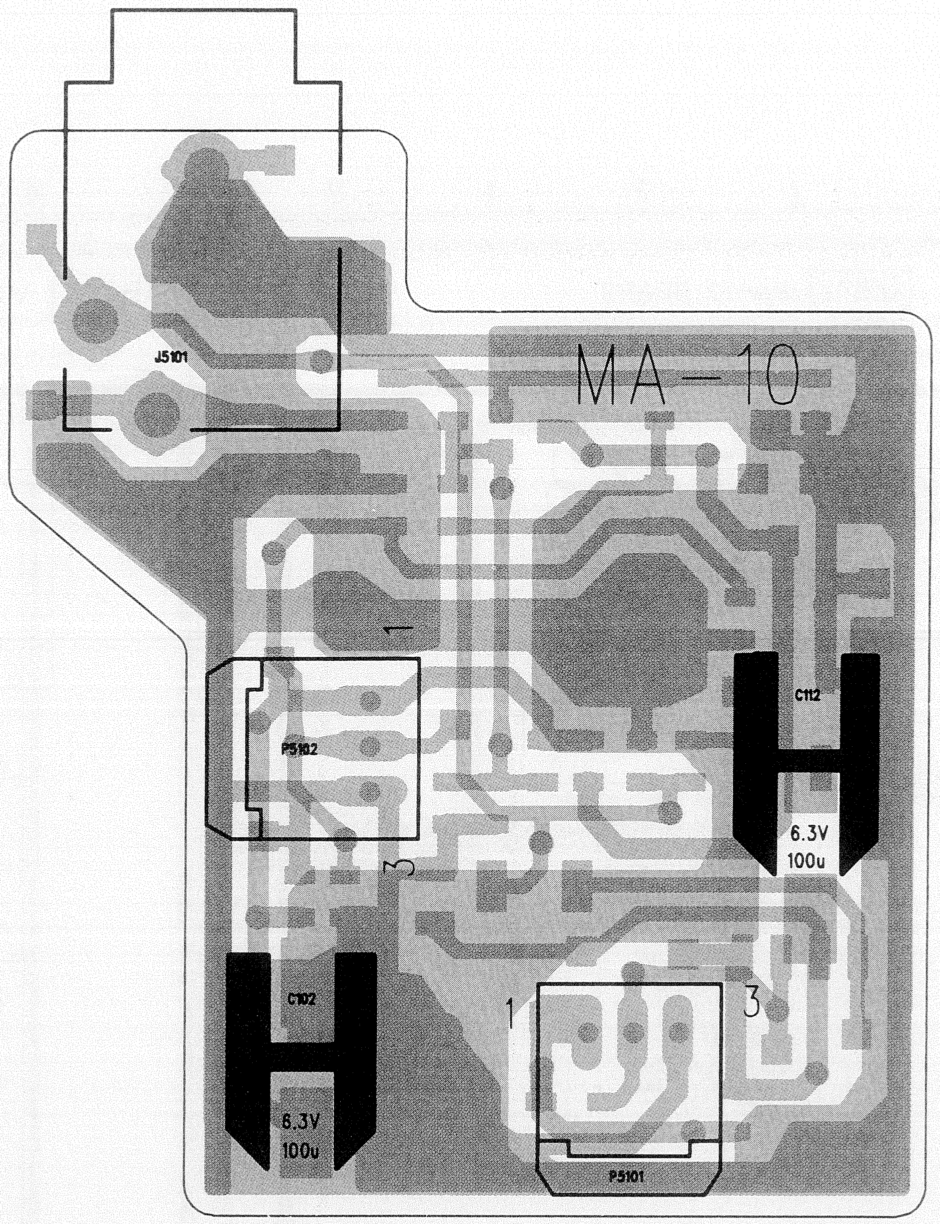
- SIGNAL PATH

	AUDIO SIGNAL
REC	➡
PB	⇨

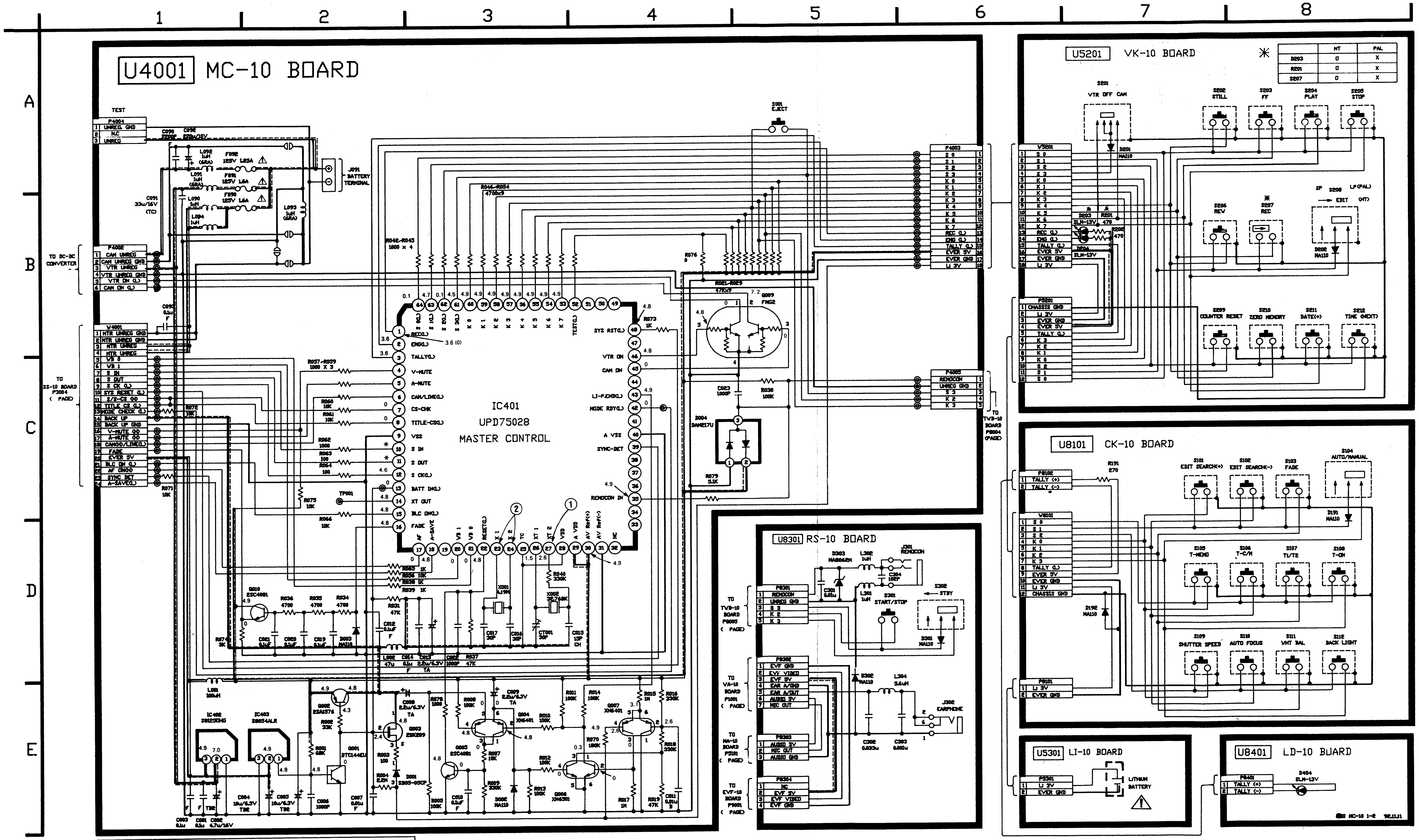
- **MA-10BD** (SIDE-A)


MA-10
3.9K
R107
22K
R102
680P
C106
0.1u
C107
0.1u
C103
0.1u
C105
10K
R101
0.01u
C108
6.8K
R105
0.01u
C109
2.7K
R104
82K
R108
100K
R103
1000p
C115
LA7293M
IC501
1u
C110
0.47u
C111
0.01u
C116
0.022u
C101
100
R106
1000p
C113
1000p
C114

- **MA-10BD** (SIDE-B)

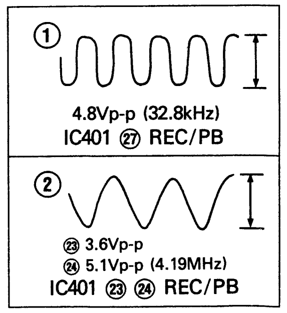

J5101
MA-10
1
P5102
3
C112
6.3V
100u
C102
6.3V
100u
1
3
P5101

• MC-10BD, VK-10BD, CK-10BD, RS-10BD, LI-10BD and LD-10BD

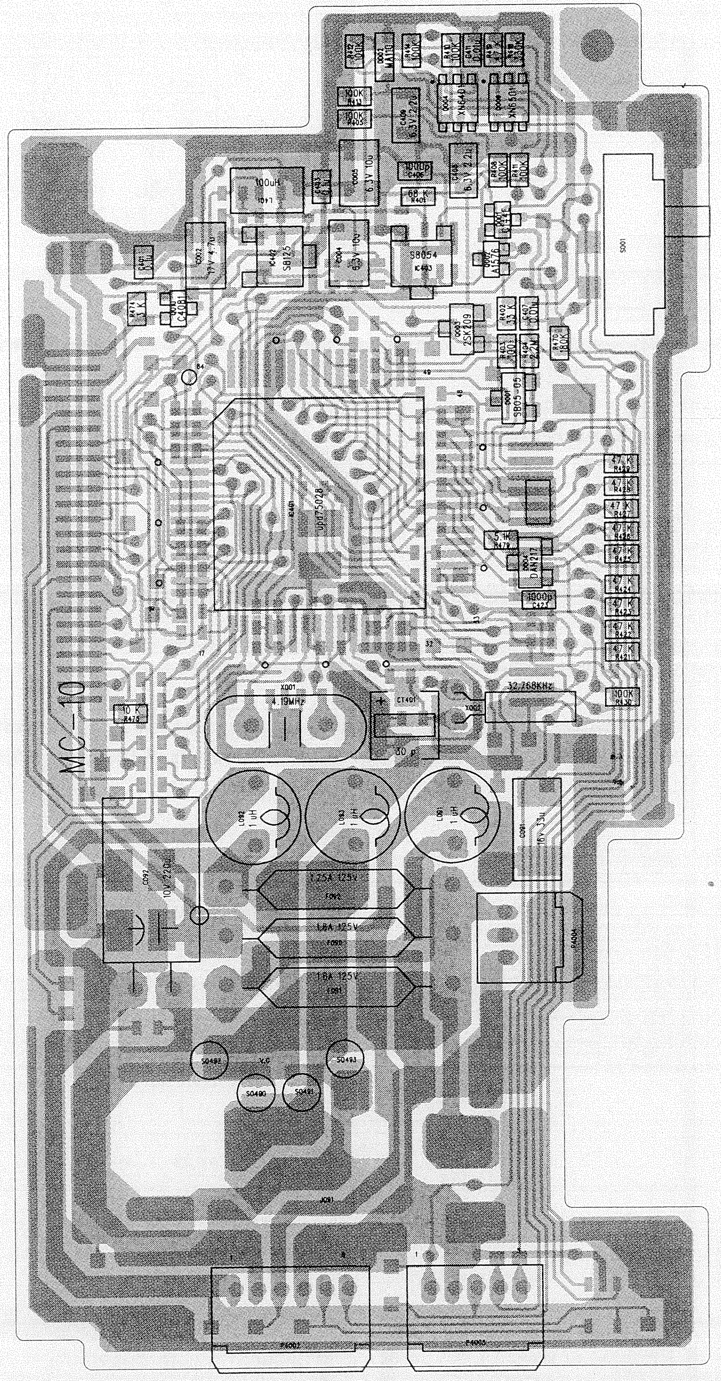

1
2
3
4
5
6
7
8
A
B
C
D
E
U4001 MC-10 BOARD
IC401
UPD75028
MASTER CONTROL
U5201 VK-10 BOARD
U8101 CK-10 BOARD
U8301 RS-10 BOARD
U5301 LI-10 BOARD
U8401 LD-10 BOARD

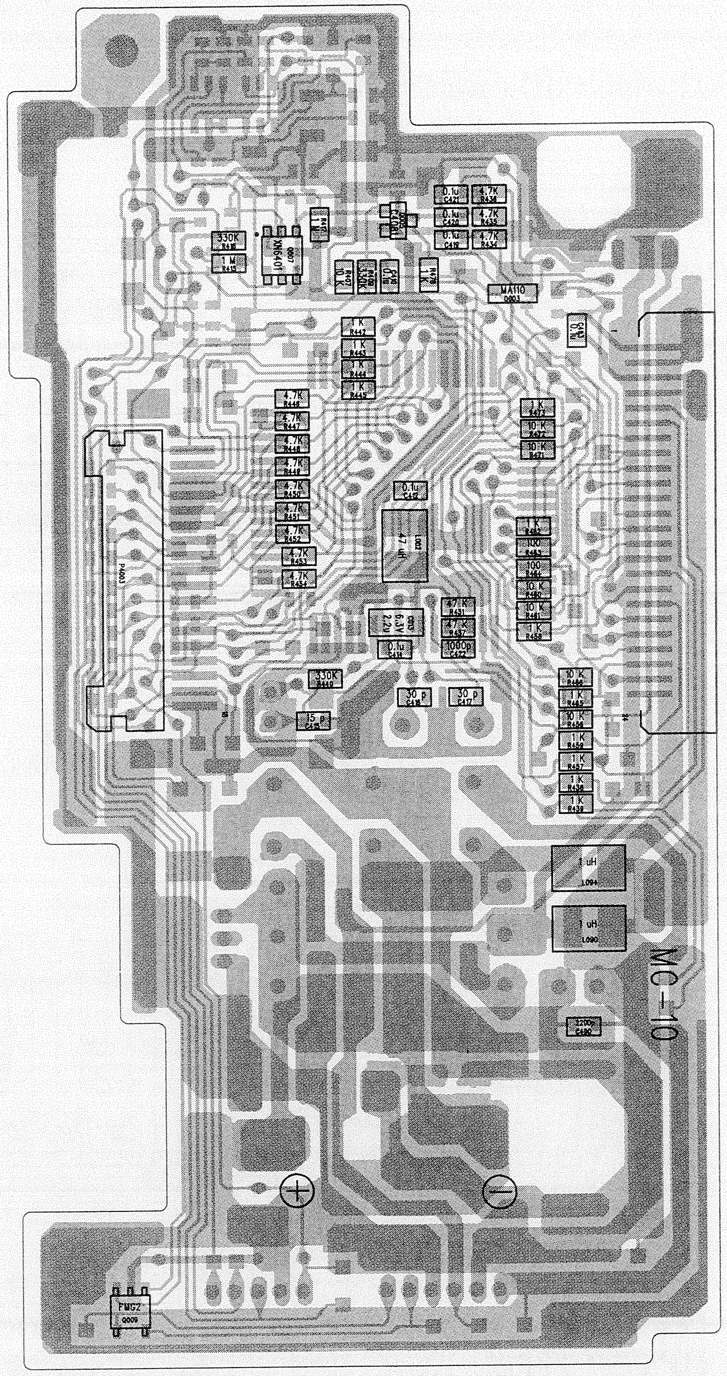
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

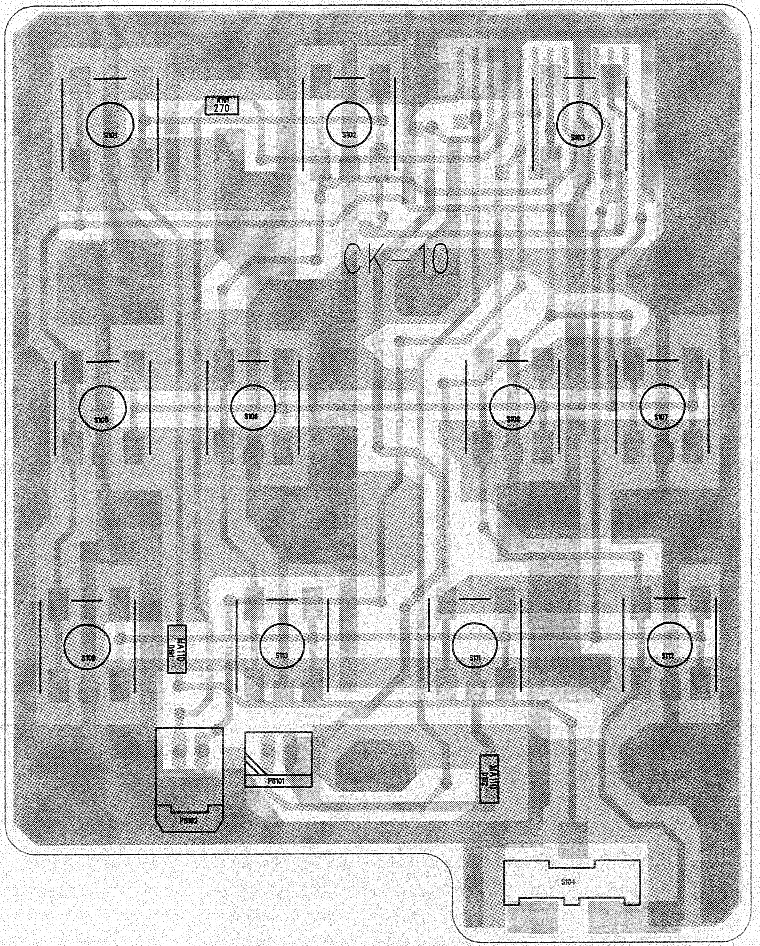
MC-10 BOARD

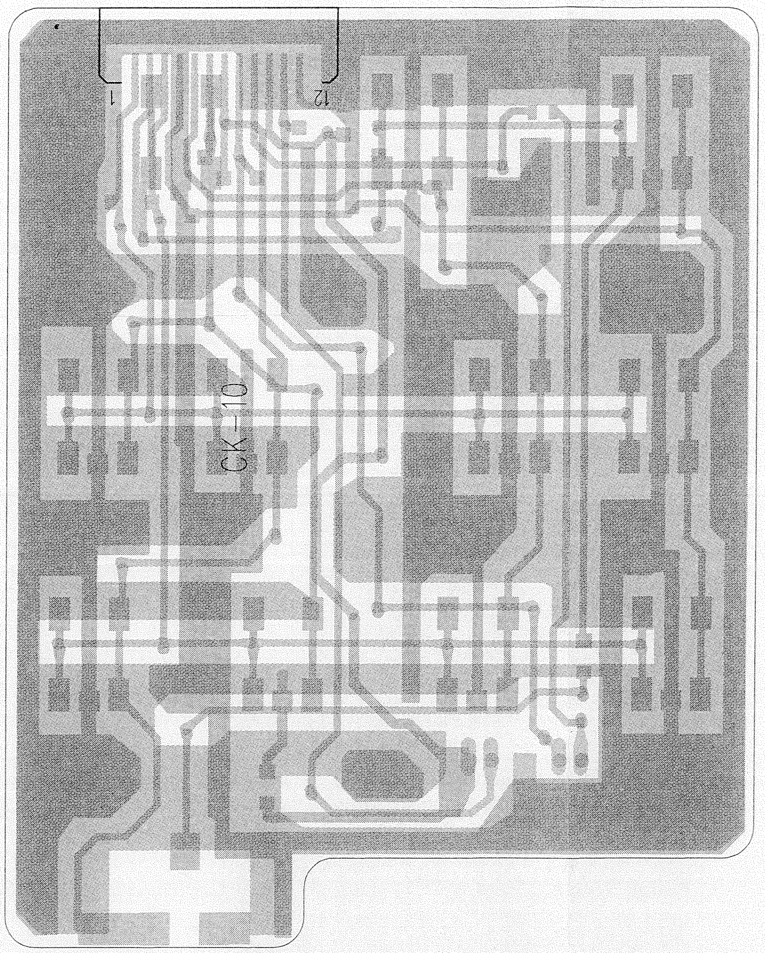

①
4.8Vp-p (32.8kHz)
IC401 ㉗ REC/PB
②
㉓ 3.6Vp-p
㉔ 5.1Vp-p (4.19MHz)
IC401 ㉓ ㉔ REC/PB

no mrk: REC/PB mode
( ) : REC mode
* : Impossible to measure the voltage at the marked point

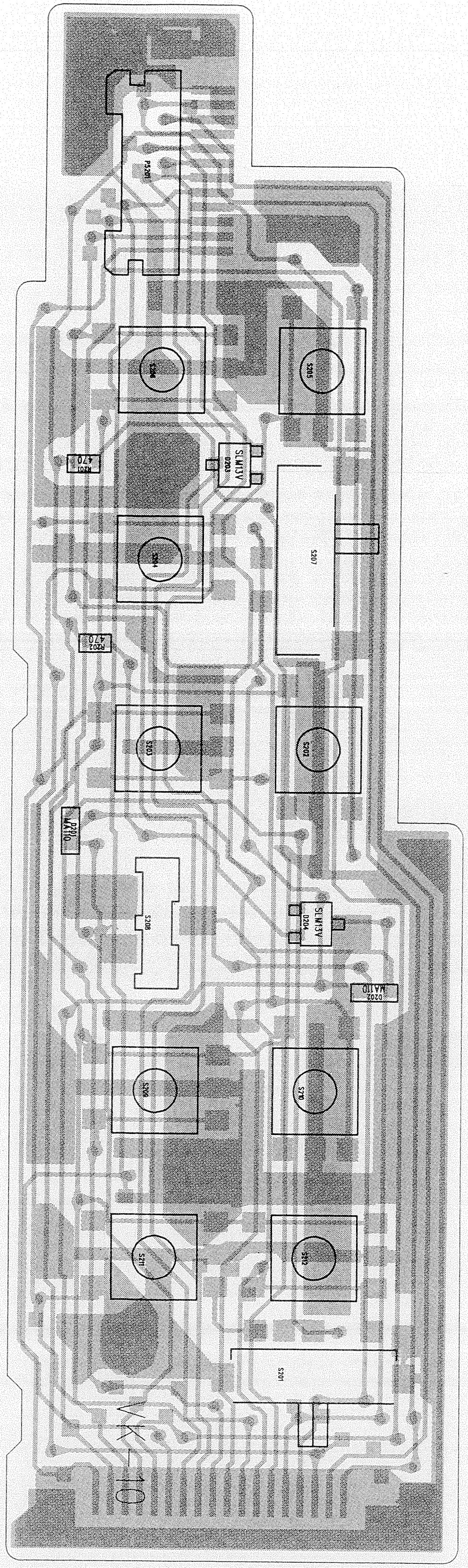

MC-10


MC-10

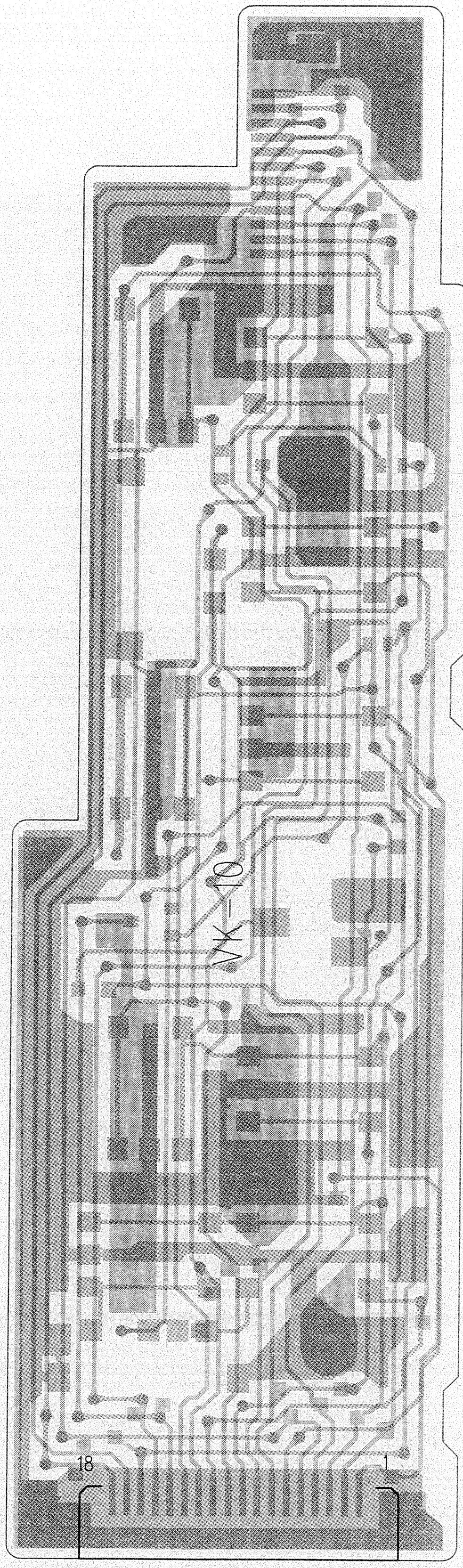

R101
270
S101
S102
S103
CK-10
S105
S106
S108
S107
S109
MA110
D101
S110
S111
S112
PB102
PB101
MA110
D102
S104


1
12
CK-10

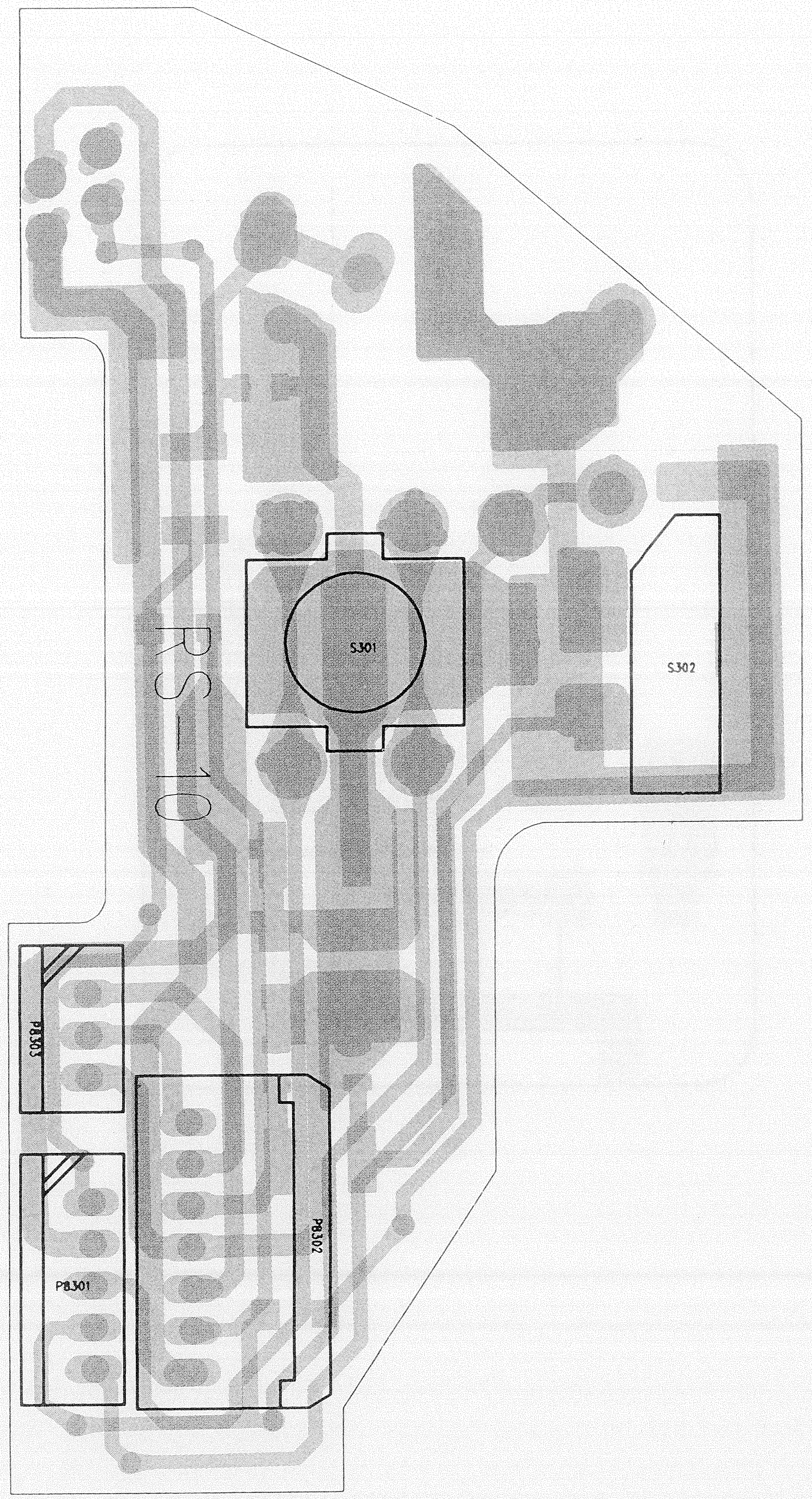
- **VK-10BD** (SIDE-A)



- **VK-10BD** (SIDE-B)

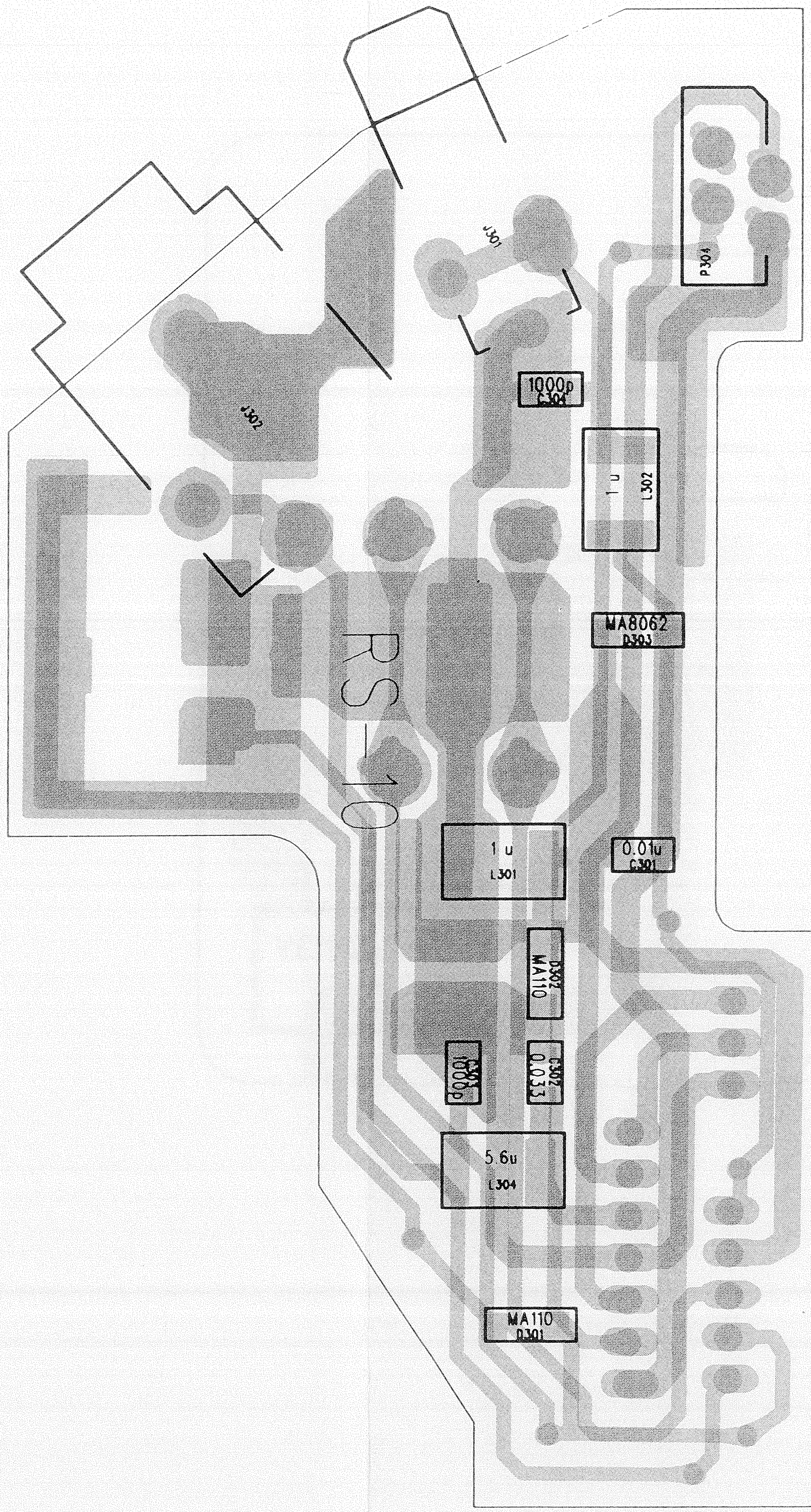


- **RS-10BD** (SIDE-A)



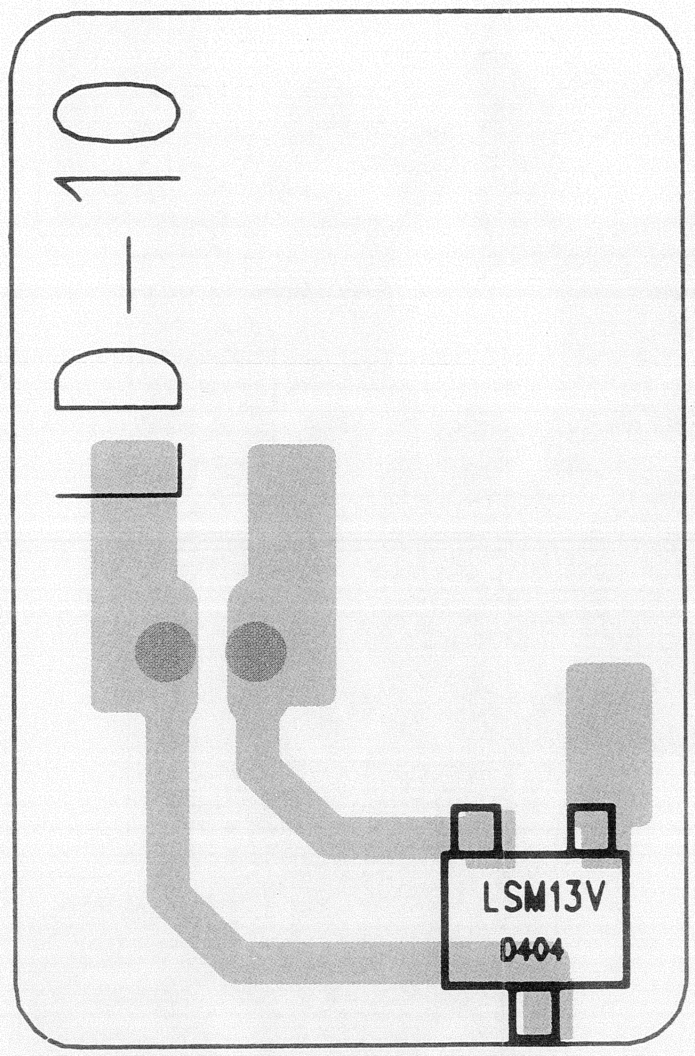
RS-10
S301
S302
PB303
PB301
PB302

- **RS-10BD** (SIDE-B)

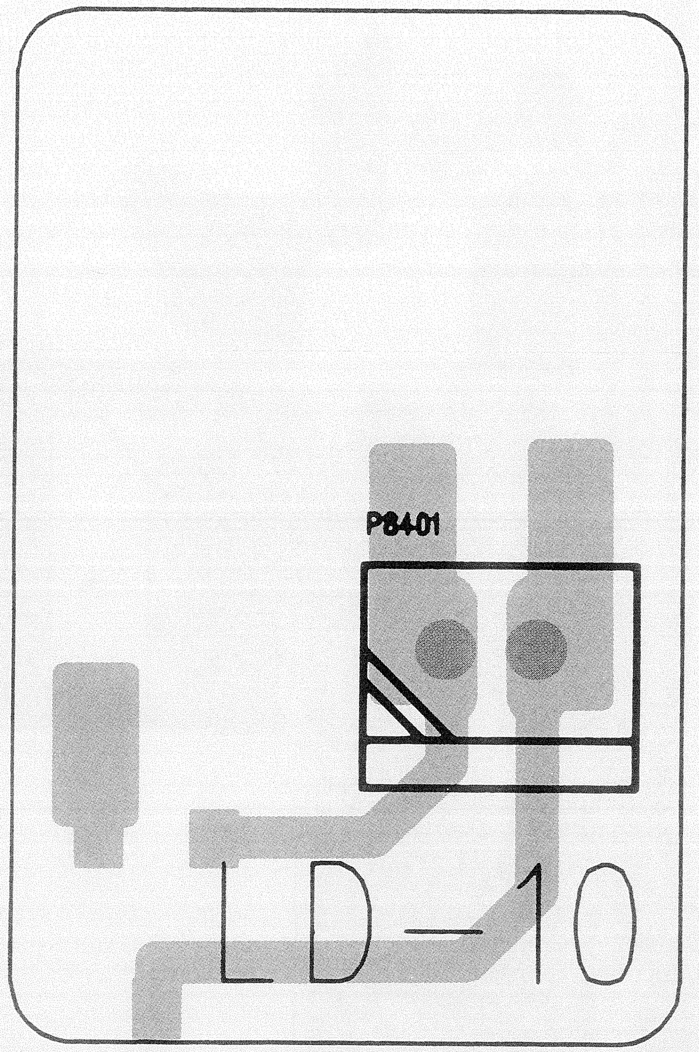


J301
J302
P304
1000p
C304
1u
L302
MA8062
D303
RS-10
1u
L301
0.01u
C301
D302
MA110
C303
1000p
C302
0.033
5.6u
L304
MA110
D301

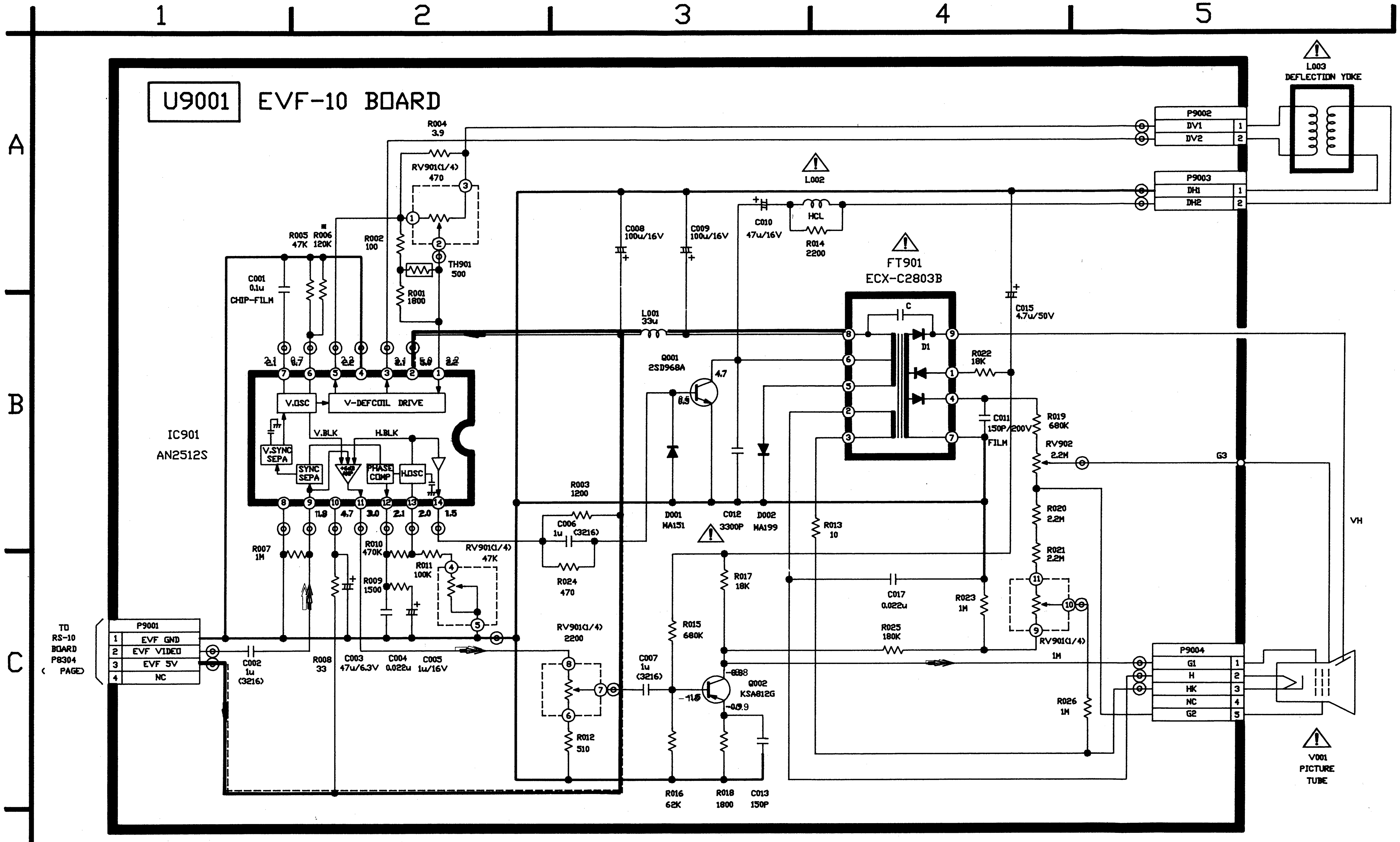
- **LD-10BD** (SIDE-A)


LD-10
LSM13V
D404

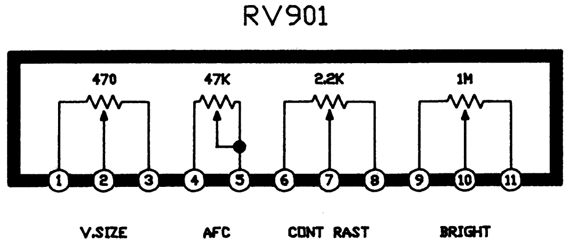
- **LD-10BD** (SIDE-B)



• EVF-10BD


1
2
3
4
5
A
B
C
D
U9001 EVF-10 BOARD
R004 3.9
RV901(1/4) 470
R005 47K
R006 120K
R002 100
TH901 500
R001 1800
C001 0.1u CHIP-FILM
IC901 AN2512S
V.OSC
V-DEFCOIL DRIVE
V.BLK
H.BLK
V.SYNC SEPA
SYNC SEPA
PHASE COMP
H.OSC
R007 1M
R010 470K
R011 100K
R009 1500
RV901(1/4) 47K
R008 33
C003 47u/6.3V
C004 0.022u
C005 1u/16V
C002 1u (3216)
TO RS-10 BOARD P8304 (PAGE)
P9001
EVF GND
EVF VIDEO
EVF 5V
NC
C008 100u/16V
C009 100u/16V
C010 47u/16V
L002
HCL
R014 2200
FT901 ECX-C2803B
L001 33u
Q001 2SD968A
R003 1200
C006 1u (3216)
R024 470
RV901(1/4) 2200
R012 510
C007 1u (3216)
D001 MA151
C012 3300P
D002 MA199
R013 10
R017 18K
R015 680K
Q002 KSA812G
R016 62K
R018 1800
C013 150P
C015 4.7u/50V
R022 18K
C011 150P/200V FILM
R019 680K
RV902 2.2M
R020 2.2M
R021 2.2M
C017 0.022u
R023 1M
R025 180K
RV901(1/4) 1M
R026 1M
G3
VH
P9002
DV1
DV2
P9003
DH1
DH2
P9004
G1
H
HK
NC
G2
L003 DEFLECTION YOKE
V001 PICTURE TUBE
D1
C

RV901


470
47K
2.2K
1M
V.SIZE
AFC
CONT RAST
BRIGHT

*

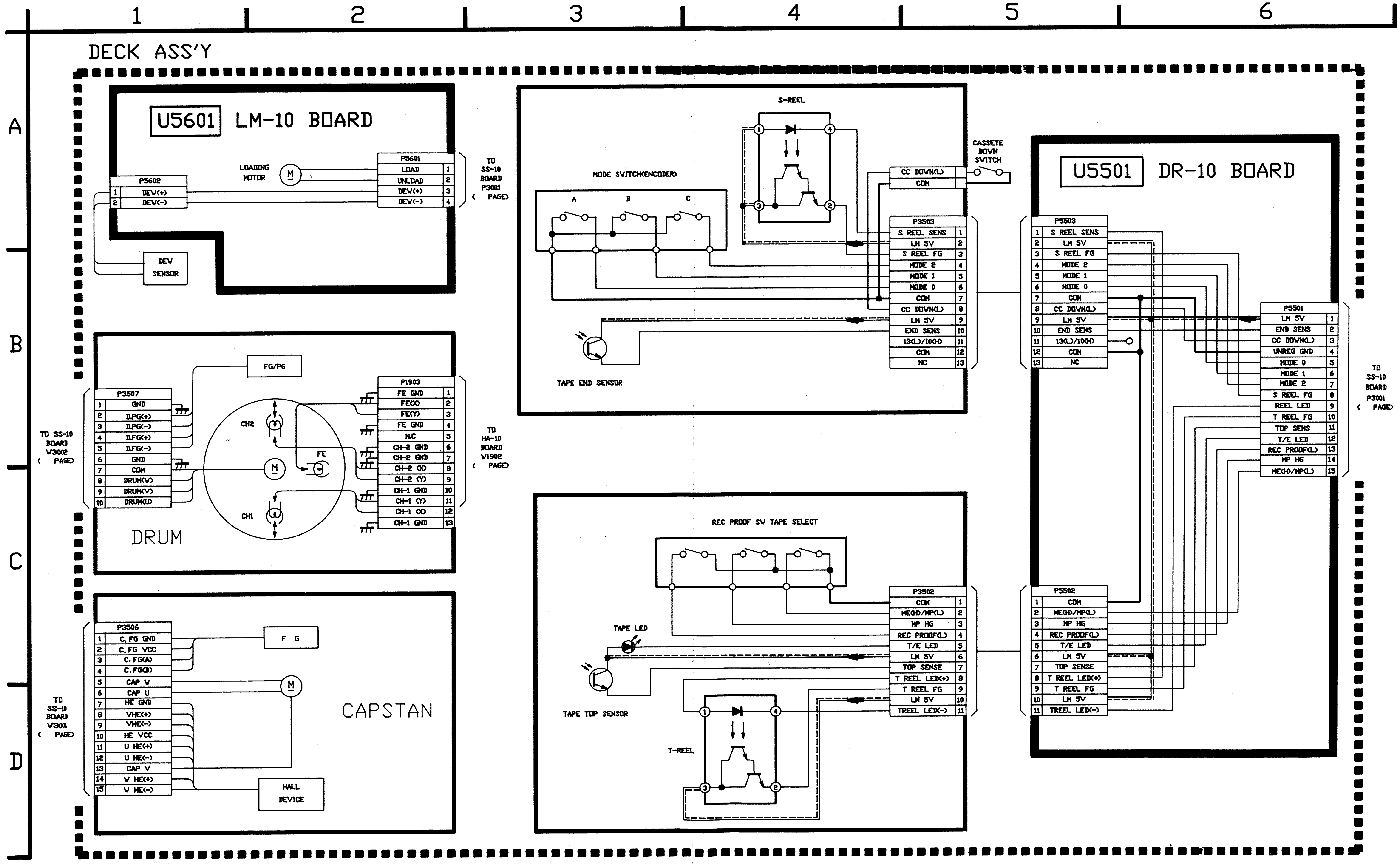
LOC.	NTSC	PAL
R006	120K	270K

• SIGNAL FLOW

	VIDEO SIGNAL			AUDIO SIGNAL
	COLOR	LUMINANCE	COLOR-LUMINANCE	
REC				
PB		⇨		

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified

- **LM-10BD and DR-10BD**


1
2
3
4
5
6
A
B
C
D
DECK ASS'Y
U5601 LM-10 BOARD
LOADING MOTOR
M
P5602
1 DEW(+)
2 DEW(-)
DEW SENSOR
P5601
LOAD 1
UNLOAD 2
DEW(+) 3
DEW(-) 4
TO SS-10 BOARD P3001 (PAGE)
DRUM
FG/PG
P3507
1 GND
2 D.PG(+)
3 D.PG(-)
4 D.FG(+)
5 D.FG(-)
6 GND
7 COM
8 DRUM(V)
9 DRUM(V)
10 DRUM(U)
TO SS-10 BOARD W3002 (PAGE)
CH2
CH1
FE
M
P1903
FE GND 1
FE(X) 2
FE(Y) 3
FE GND 4
N.C 5
CH-2 GND 6
CH-2 GND 7
CH-2 (X) 8
CH-2 (Y) 9
CH-1 GND 10
CH-1 (Y) 11
CH-1 (X) 12
CH-1 GND 13
TO HA-10 BOARD W1902 (PAGE)
CAPSTAN
F G
M
HALL DEVICE
P3506
1 C, FG GND
2 C, FG VCC
3 C, FG(A)
4 C, FG(B)
5 CAP W
6 CAP U
7 HE GND
8 VHE(+)
9 VHE(-)
10 HE VCC
11 U HE(+)
12 U HE(-)
13 CAP V
14 W HE(+)
15 W HE(-)
TO SS-10 BOARD W3001 (PAGE)
MODE SWITCH(ENCODER)
A
B
C
S-REEL
TAPE END SENSOR
CASSETE DOWN SWITCH
CC DOWN(L)
COM
P3503
S REEL SENS 1
LM 5V 2
S REEL FG 3
MODE 2 4
MODE 1 5
MODE 0 6
COM 7
CC DOWN(L) 8
LM 5V 9
END SENS 10
13(L)/10(H) 11
COM 12
NC 13
REC PROOF SW TAPE SELECT
TAPE LED
TAPE TOP SENSOR
T-REEL
P3502
COM 1
ME(H)/MP(L) 2
MP HG 3
REC PROOF(L) 4
T/E LED 5
LM 5V 6
TOP SENSE 7
T REEL LED(+) 8
T REEL FG 9
LM 5V 10
TREEL LED(-) 11
U5501 DR-10 BOARD
P5503
1 S REEL SENS
2 LM 5V
3 S REEL FG
4 MODE 2
5 MODE 1
6 MODE 0
7 COM
8 CC DOWN(L)
9 LM 5V
10 END SENS
11 13(L)/10(H)
12 COM
13 NC
P5501
LM 5V 1
END SENS 2
CC DOWN(L) 3
UNREG GND 4
MODE 0 5
MODE 1 6
MODE 2 7
S REEL FG 8
REEL LED 9
T REEL FG 10
TOP SENS 11
T/E LED 12
REC PROOF(L) 13
MP HG 14
ME(H)/MP(L) 15
TO SS-10 BOARD P3001 (PAGE)
P5502
1 COM
2 ME(H)/MP(L)
3 MP HG
4 REC PROOF(L)
5 T/E LED
6 LM 5V
7 TOP SENSE
8 T REEL LED(+)
9 T REEL FG
10 LM 5V
11 TREEL LED(-)

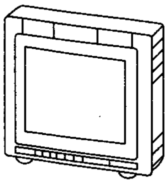
4. ADJUSTMENTS

1) CAMERA BLOCK ADJUSTMENTS

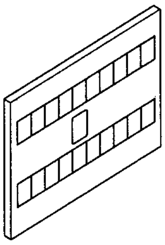
1-1) TABLE FOR SERVICING TOOLS

Ref. No	NAME	Ref. No	NAME
J-1	Viewer 5100°K	J-8	Warm filter (W4)
J-2	Gray scale (γ=0.45)	J-9	Camera block fixing tool
J-3	Color bar chart	J-10	Jig for TWB-10 BD
J-4	In mega cycle chart	J-11	Extension code (14P)
J-5	Siemens star	J-12	Adjustment controller
J-6	AF Adjustment chart	J-13	Adjustment (+) screwdriver
J-7	ND filter 1.0, 2.0	J-14	Flange back adjustment tool

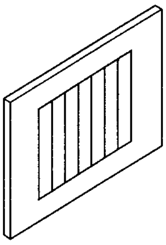
J-1



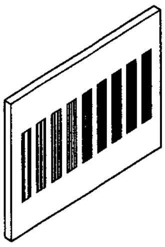
J-2



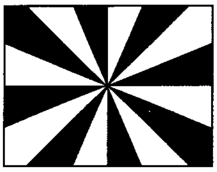
J-3



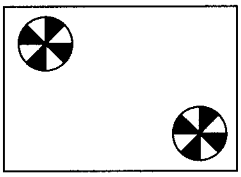
J-4



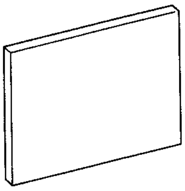
J-5



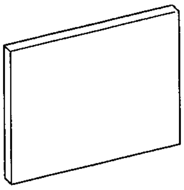
J-6



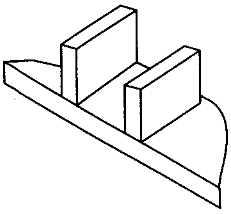
J-7



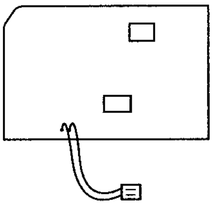
J-8



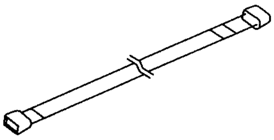
J-9



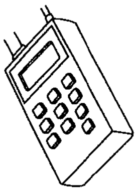
J-10



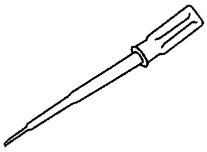
J-11



J-12



J-13



J-14

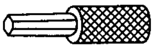


Table 1-1

1-2) ADJUSTMENT ITEM AND ORDER

1-2-1) 28MHz Local oscillation Adjustment (CAD-10 BD)
1-2-2) PLL Adjustment (CAD-10 BOARD)
1-2-3) EVR Initial settings
1-2-4) FLANGE BACK Adjustment
1-2-5) CAMERA DC-DC Converter output voltage check
1-2-6) Vsub/PG Adjustment
1-2-7) IRIS Adjustment
1-2-8) AGC Adjustment
1-2-9) MATRIX Adjustments
    1-2-9-1) Y1 GAIN Adjustment
    1-2-9-2) Y2 GAIN Adjustment
1-2-10) Yh GAIN Adjustment
1-2-11) CHROMA LEVEL Adjustment
1-2-12) SETUP LEVEL Adjustment
1-2-13) H APERTURE Adjustment
1-2-14) WHITE CLIP Adjustment
1-2-15) Y LEVEL Adjustment
1-2-16) BURST LEVEL Adjustment
1-2-17) MAX GAIN Adjustment
1-2-18) WHITE BALANCE Adjustments
    1-2-18-1) PRE WHITE BALANCE Adjustment
    1-2-18-2) C1 GAIN Adjustment
1-2-19) Color Reproduction Adjustment
    1-2-19-1) GAIN Adjustment
    1-2-19-2) HUE Adjustment
1-2-20) AUTO WHITE BALANCE Check
1-2-21) DIGITAL TITLER SYSTEM Adjustments
    1-2-21-1) Title Oscillation Adjustment
    1-2-21-2) Title A/D LEVEL Adjustment
    1-2-21-3) CHARACTER POSITION Adjustment
1-2-22) AUTO FOCUS Adjustment

1-3) MEASURING INSTRUMENTS

1-3-1) Vectorscope
1-3-2) Waveform Monitor
1-3-3) Oscilloscope
1-3-4) Color monitor TV
1-3-5) Digital voltmeter
1-3-6) DC regulated power supply

1-4) SETUP AND CONNECTION

Refer to "DISASSEMBLY" to remove the cabinet and each board.
1-4-1) Set the camera block to the tool J-9 as in Fig 1-4-1.
1-4-2) Set up the camera block and adjustment Jig (J-10, J-12) as in Fig 1-4-2.

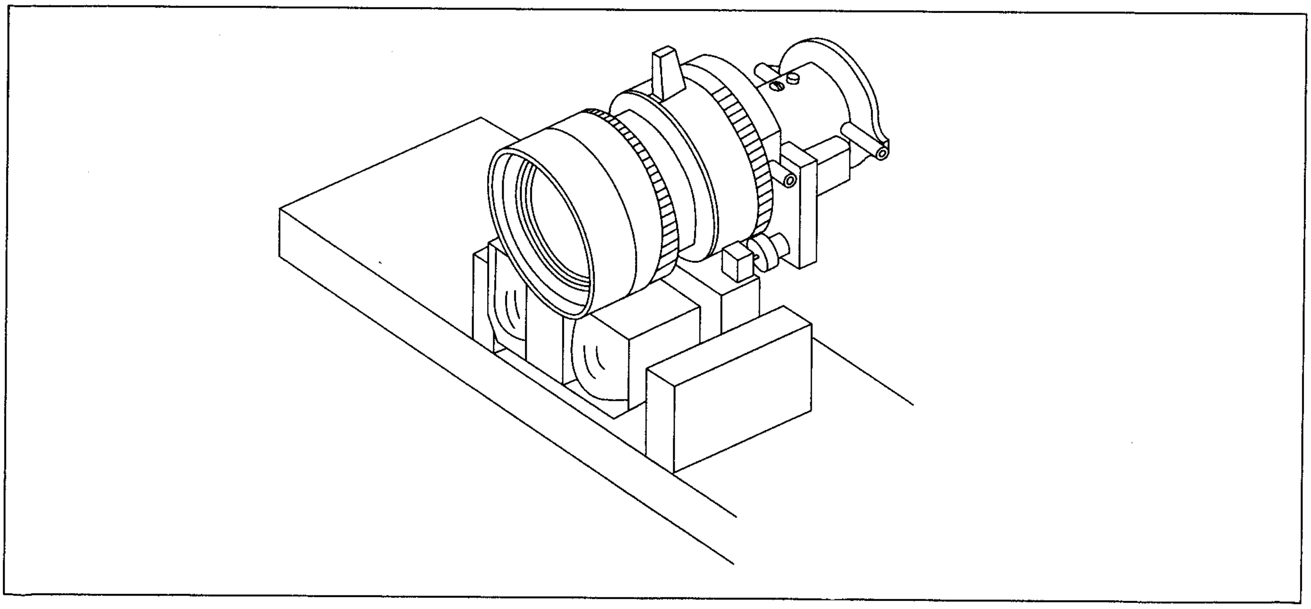


Fig. 1-4-1

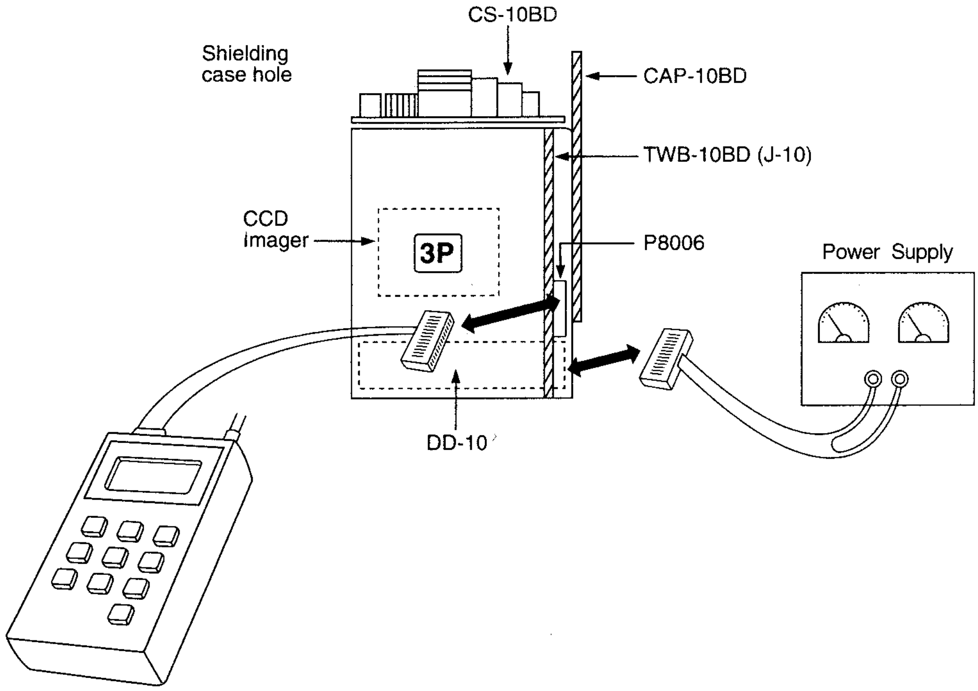

CS-10BD
Shielding case hole
CAP-10BD
TWB-10BD (J-10)
CCD imager
3P
P8006
Power Supply
DD-10

Fig. 1-4-2

1-5) NOTES

1-5-1) Perform the adjustment after aging for 10 minutes or more.

1-5-2) Perform the adjustment in the order as shown in the section 8 as a rule.

1-6) STANDARD SETTING

1-6-1) Use the 5100° K viewer for a subject.

1-6-2) Set to about 2.5m the distance from subject and adjust with the zoom lever and focus ring so that each picture frame size becomes as shown in Figs. 1-6-1, and 1-6-2 when performing the adjustment with the gray scale and the color bar.

1-6-3) Operate the zoom lever so that the viewer without chart is monitored on whole screen when performing the adjustment with all white pattern.

1-6-4) Connection of equipment (Fig. 1-6-3).

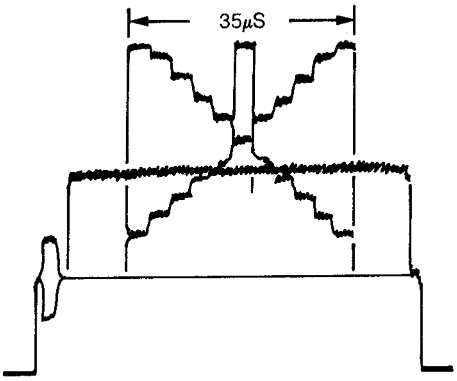


Fig. 1-6-1

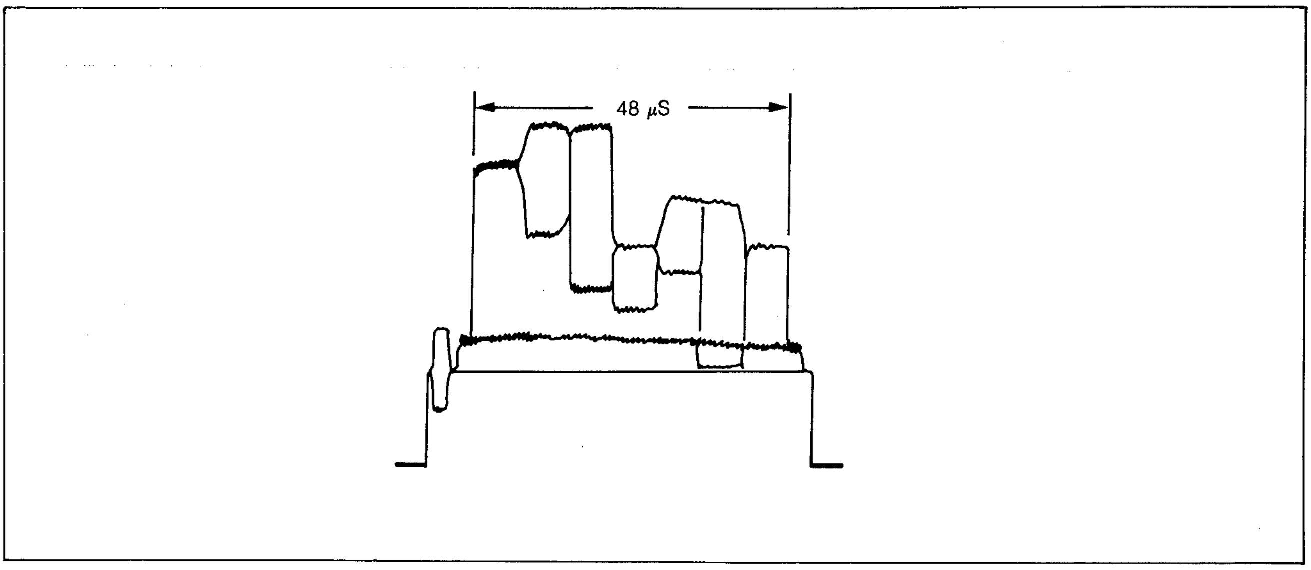


Fig. 1-6-2

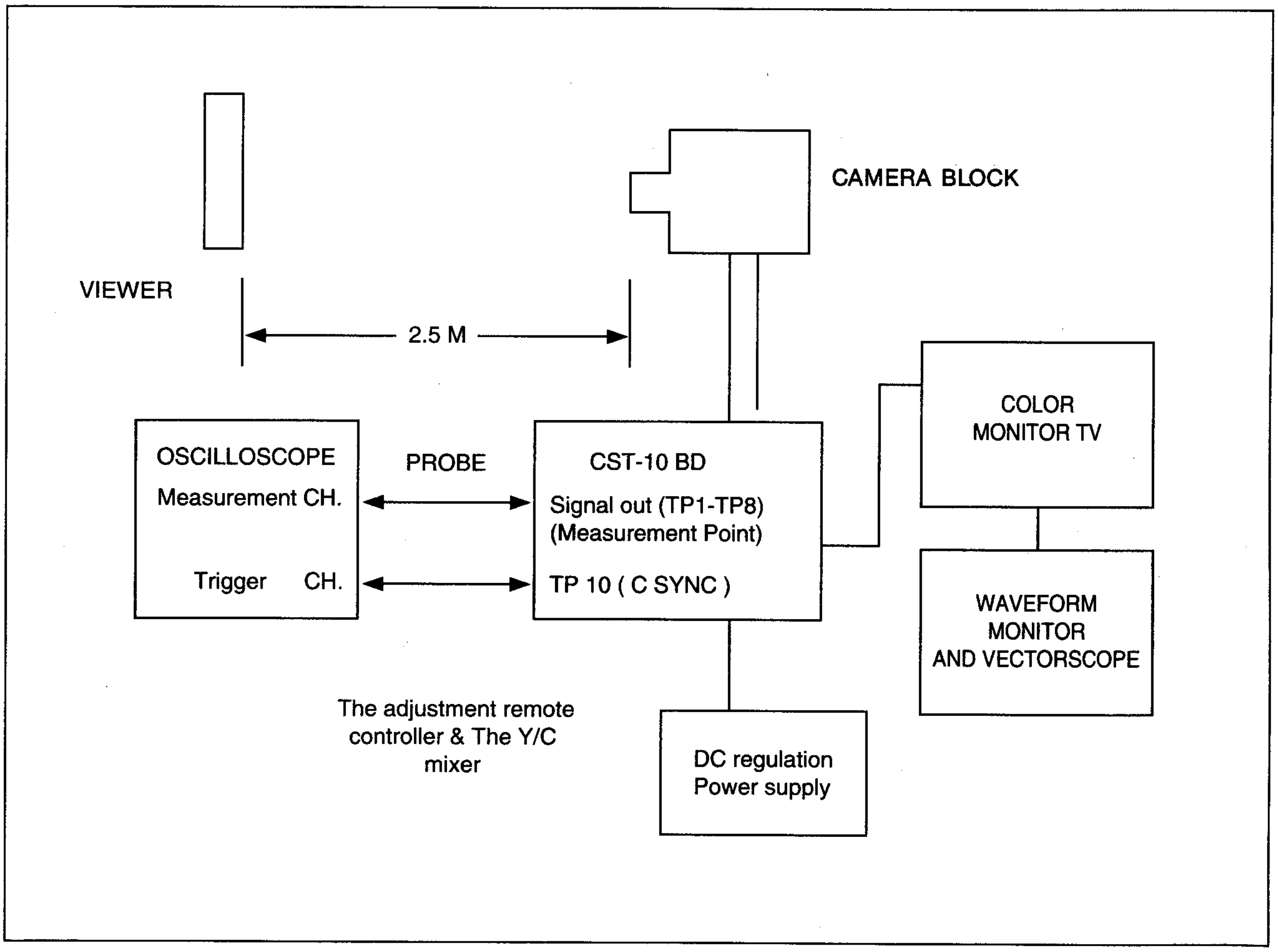

CAMERA BLOCK
VIEWER
2.5 M
OSCILLOSCOPE
Measurement CH.
Trigger CH.
PROBE
CST-10 BD
Signal out (TP1-TP8)
(Measurement Point)
TP 10 (C SYNC)
COLOR
MONITOR TV
WAVEFORM
MONITOR
AND VECTORSCOPE
The adjustment remote
controller & The Y/C
mixer
DC regulation
Power supply

Fig. 1-6-3

1-7) ADJUSTMENT CONTROLLER

An EVR (electronic variable resistor) is used as the adjustment element for the camera block, replacing the conventional semi-fixed resistor. The EVR is controlled by the EVR/AWB microprocessor (IC865 on TWB-10 board). This microprocessor reads the data written in the nonvolatile memory of the microprocessor and sends it to the EVR. The EVR converts this digital data to analog data (8 bits for each adjustment point) and creates the adjustment voltage.

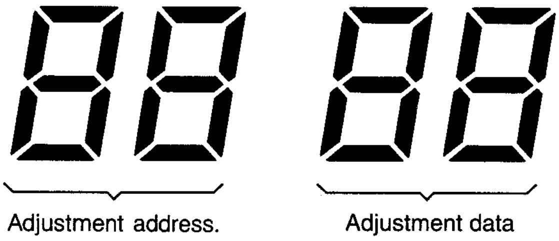
Thus, it is necessary to change the adjustment data contained in the nonvolatile memory when adjusting camera block, and the adjustment memory is used for this purpose.

The adjustment remote controller performs bidirectional communications with the camera block microprocessor using the remote control signal line. Adjustment addresses and adjustment data increment/decrement commands are sent to the camera block microprocessor from the adjustment remote controller. Adjustment address and adjustment data are sent from the camera block microprocessor to the adjustment remote controller.

USE OF ADJUSTMENT REMOTE CONTROLLER

1-7-1) Connect the adjustment remote controller to the remote terminal (P8006 TWB-10 board)

1-7-2) Turn on the power of the main unit.



1-7-3) Designate the desired adjustment address using the adjustment remote controller.

The adjustment address is changed by pressing address +/− button. (address changes the adjustment order in turn.)

1-7-4) Perform adjustment by incrementing/decrementing the adjustment data.

The adjustment data is changed using the +4/−4 button and +1/−1 button.

Hexadecimal	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
LCD indication	0	1	2	3	4	5	6	7	8	9	A	b	c	d	E	F
Decimal equivalent	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15

Table 1-7-1

1-7-5) Press SAVE KEY to store the adjustment data in the memory

1-8) CAMERA SYSTEM ADJUSTMENTS

1-8-1) 28MHz Local Oscillation Adjustment (CAD-10 BD)

Subject	Not needed
Measuring Point	CAD-10 BD TP603
Measuring instrument	Frequency counter
Adjustment Point	CAD-10 BD CT601
Specified Value	14187500±71Hz

(Adjustment method)
1) Adjust CT601 so that the oscillation frequency is 14187500±71Hz.

1-8-2) PLL Adjustment (CAD-10 BOARD)

Subject	Not needed
Measuring Point	CAD-10 BD TP604
Measuring Instrument	Digital Voltmeter
Adjustment Point	CAD-10 BD CT602
Specified Value	2.5±0.2V

(Adjustment method)
1) Adjust to 2.5±0.2Vdc with CT602

1-8-3) EVR Initial Settings

Set to the following initial setting of the adjustment data (memoried within Adjustment remote controller microprocessor) only when the EEPROM (IC862 ON TWB-10 BD) was replaced.

No.	Adjustment address	Initial Value	No.	Adjustment address	Initial Value
1	3C (for preAWB Adj.)	38	14	06 (WHITE CLIP)	9A
2	3D (for preAWB Adj.)	7B	15	03 (Y LEVEL)	9E
3	01 (Vsub)	88	16	05 (BURST LEVEL)	D0
4	02 (PG)	88	17	16 (MAX GAIN)	AA
5	04 (IRIS)	77	18	07 (B GAIN)	DF
6	OA (AGC)	88	19	08 (R GAIN)	C8
7	17 (VAP GAIN)	90	20	09 (C1 GAIN)	B0
8	18 (Y1 LEVEL)	90	21	0B (R-Y HUE)	A3
9	1C (Y2 LEVEL)	92	22	0C (B-Y HUE)	91
10	1B (Yh GAIN)	75	23	14 (B-Y GAIN)	6E
11	11 (CHROMA LEVEL)	90	24	15 (R-Y GAIN)	8F
12	12 (SET UP)	66	25	19 (R CONT)	—
13	13 (HAP)	86	26	1A (B CONT)	—

(Adjustment method)
1) Press RESET KEY (After PRESET KEY press, See the adjustment remote controller to store for adjustment initial data in last adjustment address)
2) Turn off/on main power

1-8-4) FLANGE BACK Adjustment

Subject	**Not needed**
Measurement Point	Check with a monitor TV
Measuring instrument	
Adjustment Element	Flange back adjustment pin ②
Tools	(+) screwdriver, FLANGE BACK Adjustment Tool

(Adjustment method)

1) Press the focus switch to set to the manual mode
2) Position a Siemens star 3m directly in front of the lens reference plane.
3) Orient the camera block to have the center of the Siemens star imaged on the monitor TV screen coincide with the monitor TV screen center.
4) Check to assure the smooth motion of the zoom ring to both its extreme WIDE position (7mm) and TELE position (56mm) after pressing the zoom button, and then set it at the extreme WIDE position.
5) Set the lens focusing mark at the center of "3". (Fig. 1-8-1)

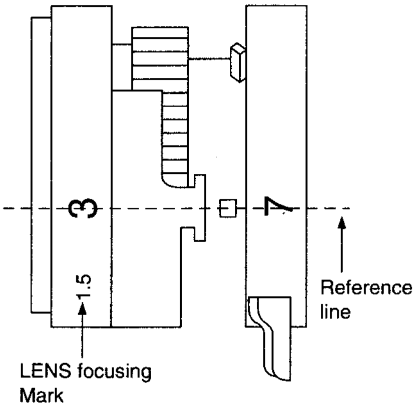


Fig. 1-8-1

6) Loosen flange back setscrew ① with a (+) screwdriver (See Fig 1-8-3)
7) By turning the flange back adjusting pin ② while watching the monitor screen, attain the optimum definition of a wedge at the Siemens star center on the screen (Turn it a few turns to the left and right to ensure optimum definition)
8) While holding the flange back adjusting Pin ② to prevent further rotation, retighten the flange back setscrew ①.
9) With the zoom ring fixed at its WIDE end. Turn the focusing ring and set it to the position that provides the optimum definition image of the wedge. Check to assure the focusing mark protrusion position is within the range shown in Fig 1-8-2. Also rotate the focusing ring to the close (1.5m) and far (∞) extremes and confirm that the wedge is no longer in focus.

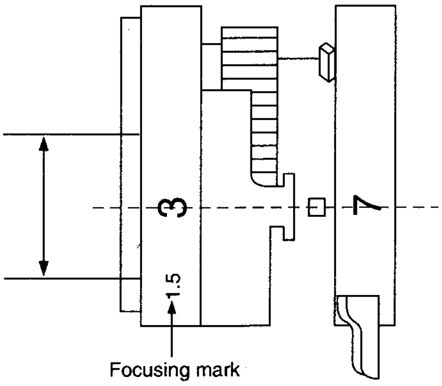


Fig. 1-8-2

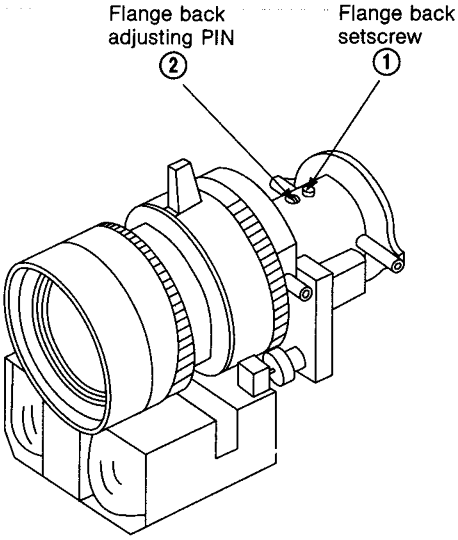


Fig. 1-8-3.

1-8-5) CAMERA DC-DC Converter Output Voltage check (CAD-10 BD P6002/CAP-10 BD P7007)

Measuring instrument: Digital Voltmeter

VOLT	Measurement Point	Specified Value
23V	P6002 PIN 4	23 ±0.2V
15V	P6002 PIN 3	15 ±0.1V
−9V	P6002 PIN 2	−9 ±0.1V
5V (A)	P7007 PIN 1	5 ±0.05V
5V (D)	P7007 PIN 3	5 ±0.05V

1-8-6) Vsub/PG CONTROL Adjustment

1-8-6-1) Vsub Adjustment

Subject	Not needed
Measurement Point	CAD-10 BD TP601 (Vsub)
Mesuring instrument	DIGITAL VOLTMETER
Adjustment Address	ADDRESS 01
Specified Value	(Voltage indicated by the imager) ±0.3 Vdc

(Adjustment method)

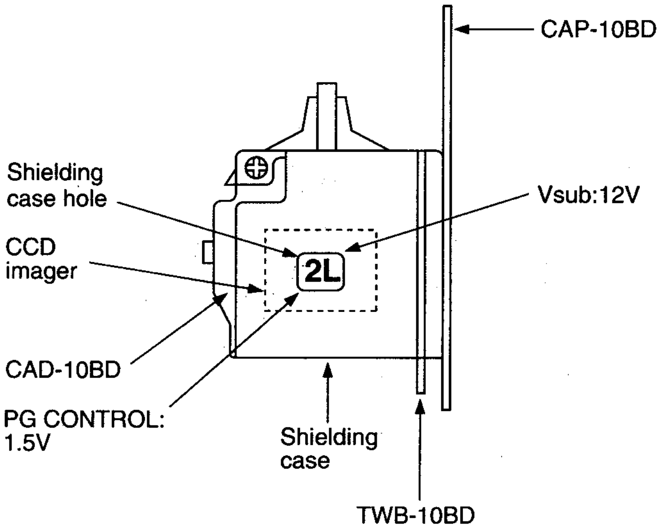
1) Change the adjustment data at adjustment address 01 using the adjustment remote controller to set the Vsub voltage to (voltage indicated by the imager) ±0.3Vdc
2) Press SAVE KEY to store the adjustment data in the memory

1-8-6-2) PG CONTROL Adjustment

Subject	Not needed
Measurement Point	CAD-10 TP602 (PG CONT)
Measuring instrument	DIGITAL VOLTMETER
Adjustment Address	ADDRESS 02
Specified Value	(Voltage indicated by the imager) ±0.1 Vdc

(Adjustment method)

1) Change the adjustment data at adjustment address 02 using the adjustment remote controller to set the Vsub voltage to (voltage indicated by the imager) ±0.1Vdc
2) Press SAVE KEY to store the adjustment data in the memory


CAP-10BD
Shielding case hole
Vsub:12V
CCD imager
2L
CAD-10BD
PG CONTROL: 1.5V
Shielding case
TWB-10BD

*PG CONTROL Voltage Code

Code	Voltage (Vdc)
0	0.5
1	1.0
2	1.5
3	2.0
4	2.5
5	3.0
6	3.5
7	4.0

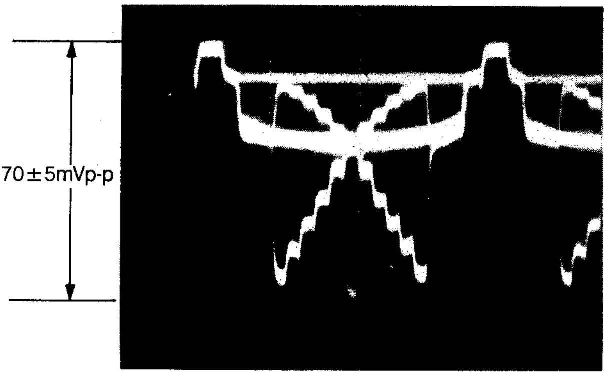
*Vsub Voltage Code

Code	Voltage (Vdc)	Code	Voltage (Vdc)
A	7.0	N	13.0
B	7.5	P	13.5
C	8.0	Q	14.0
D	8.5	R	14.5
E	9.0	S	15.0
F	9.5	T	15.5
G	10.0	U	16.0
H	10.5	V	16.5
J	11.0	W	17.0
K	11.5	X	17.5
L	12.0	Y	18.0
M	12.5	Z	18.5

1-8-7) IRIS Adjustment

Subject	GRAY SCALE CHART
Measurement Point	CST-10 BD TP3 (IRIS OUT) OR TP10 (SIGNAL OUT)
Measuring instrument	OSCILLOSCOPE (TIME/DIV: 10μS, VOLTS/DIV: 50mV)
Adjustment Address	ADDRESS 04
Specified Value	270±5mVp-p

(adjustment method)
1) Set the adjustment address to 04 with the adjustment remote controller.
2) Without attaching an ND filter, change the adjustment data with the adjustment remote controller to set the IRIS OUT signal level to 270±5mVp-p.
3) Attach the ND filter 1.0 to the front of the lens and confirm that there is a smooth change in the signal level.
4) Remove the ND filter and confirm that the signal level is 270±5mVp-p.
5) repeat 2) through 4) if the specified value is not met.
6) Press SAVE KEY to store the adjustment data in the memory

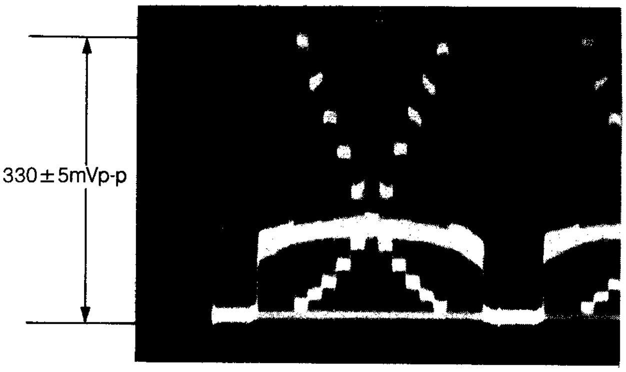


HORIZONTAL: 10μS/DIV
VERTICAL: 50mV/DIV

1-8-8) AGC Adjustment

Subject	GRAY SCALE CHART
Measurement Point	CST-10 BD TP8 (Y(LPF)OUT) OR TP10 (SIGNAL OUT)
Measuring instrument	OSCILLOSCOPE (TIME/DIV: 10μS, VOLTS/DIV: 50mV)
Adjustment Address	ADDRESS 0A
Specified Value	330±5mVp-p

(adjustment method)
1) Set the adjustment address to 0A with the adjustment remote controller.
2) Change the adjustment data with the adjustment remote controller to set the Y(LPF) signal level to 330±5mVp-p.
3) Press SAVE KEY to store the adjustment data in the memory



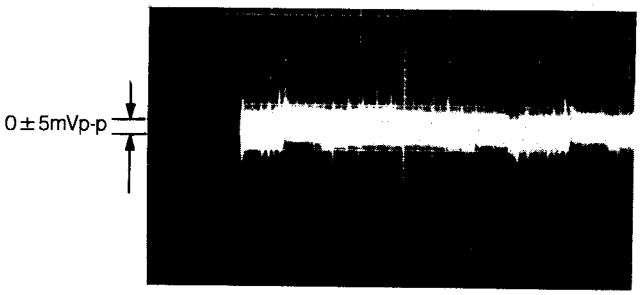
HORIZONTAL: 10μS/DIV
VERTICAL: 50mV/DIV

1-8-9) Matrix Adjustment

1-8-9-1) Y1 GAIN Adjustment

Subject	GRAY SCALE CHART
Measurement Point	CST-10 BD TP6 (VAP OUT) OR TP10 (SIGNAL OUT)
Measuring instrument	OSCILLOSCOPE (TIME/DIV: 10μS, VOLTS/DIV: 20mV)
Adjustment Address	ADDRESS 18
Specified Value	0±5mVp-p

(adjustment method)
1) Set the adjustment address to 18 with the adjustment remote controller.
2) Change the adjustment data with the adjustment remote controller to set the VAP OUT signal level to 0±5mVp-p.
3) Press SAVE KEY to store the adjustment data in the memory

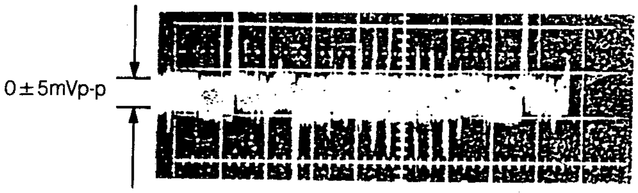


HORIZONTAL: 10μS/DIV
VERTICAL: 20mV/DIV

1-8-9-2) Y2 GAIN Adjustment

Subject	GRAY SCALE CHART
Measurement Point	CST-10 BD TP6 (VAP OUT) OR TP10 (SIGNAL OUT)
Measuring instrument	OSCILLOSCOPE (TIME/DIV: 10μS, VOLTS/DIV: 20mV)
Adjustment Address	ADDRESS 1C
Specified Value	0±5mVp-p

(adjustment method)
1) Set the adjustment address to 1C with the adjustment remote controller.
2) Change the adjustment data with the adjustment remote controller to set the VAP OUT signal level to 0±5mVp-p.
3) Press SAVE KEY to store the adjustment data in the memory

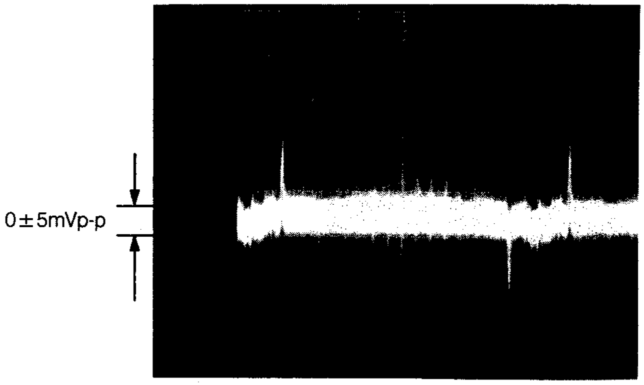


HORIZONTAL: 10μS/DIV
VERTICAL: 20mV/DIV

1-8-10) Yh GAIN Adjustment

Subject	GRAY SCALE CHART
Measurement Point	CST-10 BD TP7 (TP) OR TP10 (SIGNAL OUT)
Measuring instrument	OSCILLOSCOPE (TIME/DIV: 10μS, VOLTS/DIV: 20mV)
Adjustment Address	ADDRESS 1B
Specified Value	0±5mVp-p

(adjustment method)
1) Set the adjustment address to 1B with the adjustment remote controller.
2) Change the adjustment data with the adjustment remote controller to set the TP signal level to 0±5mVp-p.
3) Press SAVE KEY to store the adjustment data in the memory

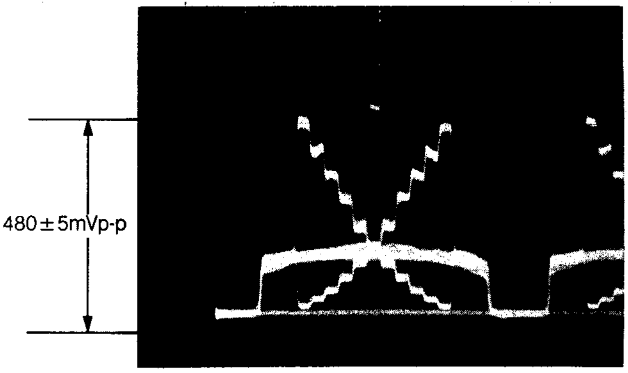


HORIZONTAL: 10μS/DIV
VERTICAL: 20mV/DIV

1-8-11) CHROMA LEVEL Adjustment

Subject	GRAY SCALE CHART
Measurement Point	CST-10 BD TP5 (WB-G) OR TP10 (SIGNAL OUT)
Measuring instrument	OSCILLOSCOPE (TIME/DIV: 10μS, VOLTS/DIV: 0.1V)
Adjustment Address	ADDRESS 11
Specified Value	480±5mVp-p

(adjustment method)
1) Set the adjustment address to 11 with the adjustment remote controller.
2) Change the adjustment data with the adjustment remote controller to set the WB-G signal level to 480±5mVp-p.
3) Press SAVE KEY to store the adjustment data in the memory

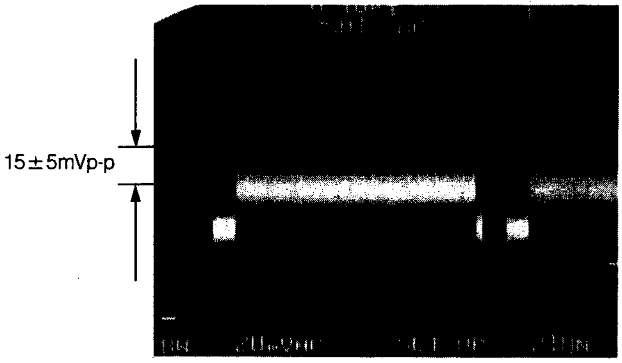


HORIZONTAL: 10μS/DIV
VERTICAL: 0.1V/DIV

1-8-12) SETUP LEVEL Adjustment

Subject	**ALL BLACK (cover lens with black cap)**
Measurement Point	CST-10 BD TP4 (CAM Y OUT) OR TP10 (SIGNAL OUT)
Measuring instrument	OSCILLOSCOPE (TIME/DIV: 10μS, VOLTS/DIV: 20mV)
Adjustment Address	ADDRESS 12
Specified Value	15±5mVp-p

(adjustment method)
1) Set the adjustment address to 12 with the adjustment remote controller.
2) Change the adjustment data with the adjustment remote controller to set the CAM Y signal level to 15±5mVp-p.
3) Press SAVE KEY to store the adjustment data in the memory

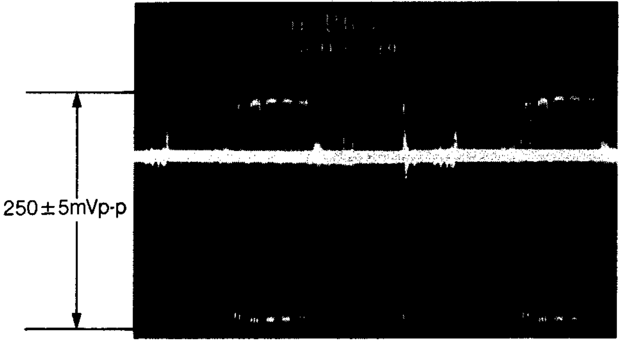


HORIZONTAL: 10μS/DIV
VERTICAL: 20mV/DIV

1-8-13) H APERTURE Adjustment

Subject	**IN MEGA CYCLE CHART**
Measurement Point	CST-10 BD TP2 (SHP OUT) OR TP10 (SIGNAL OUT)
Measuring instrument	OSCILLOSCOPE (TIME/DIV: 10μS, VOLTS/DIV: 50mV)
Adjustment Address	ADDRESS 13
Specified Value	250±5mVp-p

(adjustment method)
1) Set the adjustment address to 13 with the adjustment remote controller.
2) Focus the camera and set the aperture level to maximum.
3) Change the adjustment data with the adjustment remote controller to set the SHP signal level to 250±5mVp-p.
4) Press SAVE KEY to store the adjustment data in the memory

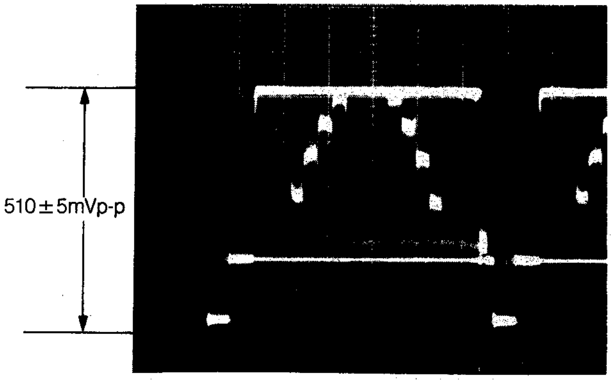


HORIZONTAL: 10μS/DIV
VERTICAL: 50mV/DIV

1-8-14) WHITE CLIP Adjustment

Subject	GRAY SCALE CHART
Measurement Point	CST-10 BD TP4 (CAM Y OUT) OR TP10 (SIGNAL OUT)
Measuring instrument	OSCILLOSCOPE (TIME/DIV: 10μS, VOLTS/DIV: 0.1V)
Adjustment Address	ADDRESS 06
Specified Value	510±5mVp-p

(adjustment method)
1) Set the adjustment address to 06 with the adjustment remote controller.
2) Change the adjustment data with the adjustment remote controller to set the CAM Y signal level to 510±5mVp-p.
3) Press SAVE KEY to store the adjustment data in the memory

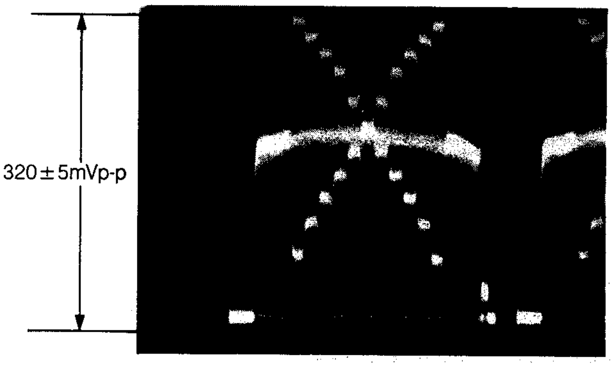


HORIZONTAL: 10μS/DIV
VERTICAL: 0.1V/DIV

1-8-15) Y LEVEL Adjustment

Subject	GRAY SCALE CHART
Measurement Point	CST-10 BD TP4 (CAM Y OUT) OR TP10 (SIGNAL OUT)
Measuring instrument	OSCILLOSCOPE (TIME/DIV: 10μS, VOLTS/DIV: 50mV)
Adjustment Address	ADDRESS 03
Specified Value	320±5mVp-p

(adjustment method)
1) Set the adjustment address to 03 with the adjustment remote controller.
2) Change the adjustment data with the adjustment remote controller to set the CAM Y signal level to 320±5mVp-p.
3) Press SAVE KEY to store the adjustment data in the memory

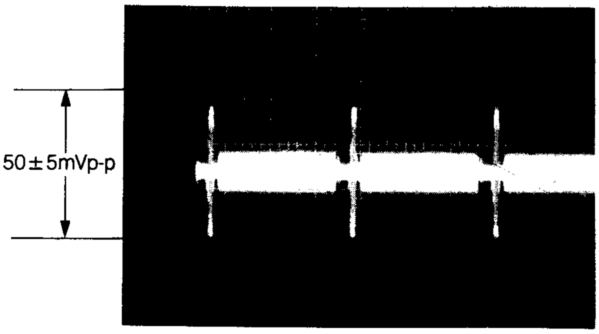


HORIZONTAL: 10μS/DIV
VERTICAL: 50mV/DIV

1-8-16) BURST LEVEL Adjustment

Subject	ALL BLACK (cover lens with black cap)
Measurement Point	CST-10 BD TP1 (C OUT) OR TP10 (SIGNAL OUT)
Measuring instrument	OSCILLOSCOPE (TIME/DIV: 20μS, VOLTS/DIV: 50mV)
Adjustment Address	ADDRESS 05
Specified Value	150±5mVp-p

(adjustment method)
1) Set the adjustment address to 05 with the adjustment remote controller.
2) Change the adjustment data with the adjustment remote controller to set the C signal level to 150±5mVp-p.
3) Press SAVE KEY to store the adjustment data in the memory

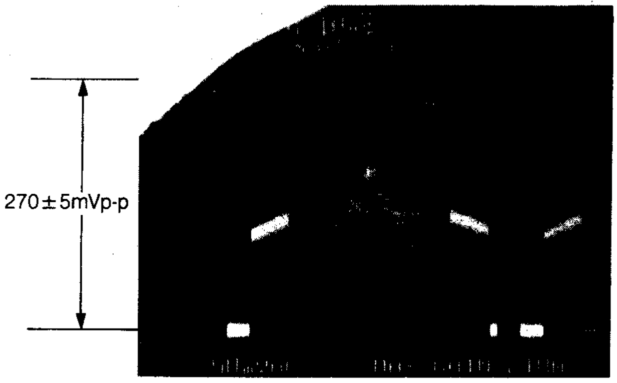


HORIZONTAL: 10μS/DIV
VERTICAL: 50mV/DIV

1-8-17) MAX GAIN Adjustment

Subject	GRAY SCALE CHART
Measurement Point	CST-10 BD TP4 (CAM Y OUT) OR TP10 (SIGNAL OUT)
Measuring instrument	OSCILLOSCOPE (TIME/DIV: 10μS, VOLTS/DIV: 50mV)
Adjustment Address	ADDRESS 16
Specified Value	270±5mVp-p

(adjustment method)
1) Cover the lens with the ND filter 2.0
2) Set the adjustment address to 16 with the adjustment remote controller.
3) Change the adjustment data with the adjustment remote controller to set the CAM Y signal level to 270±5mVp-p.
4) Press SAVE KEY to store the adjustment data in the memory



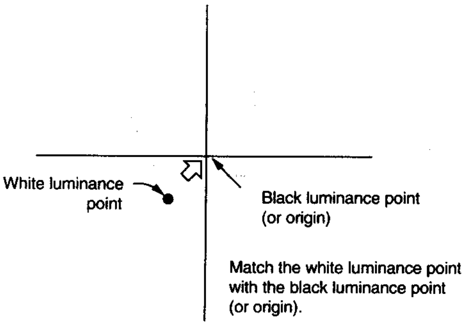
HORIZONTAL: 10μS/DIV
VERTICAL: 50mV/DIV

1-8-18) AUTO WHITE BALANCE Adjustment

1-8-18-1) PRE WHITE BALANCE Adjustment

Subject	COLOR BAR CHART (5100° K)
Measurement Point	CST-10 BD VIDEO OUT
Measuring instrument	VECTORSCOPE
Adjustment Address	ADDRESS 07 (B GAIN) 08 (R GAIN)
Specified Value	Move the white luminance point to the black luminance point

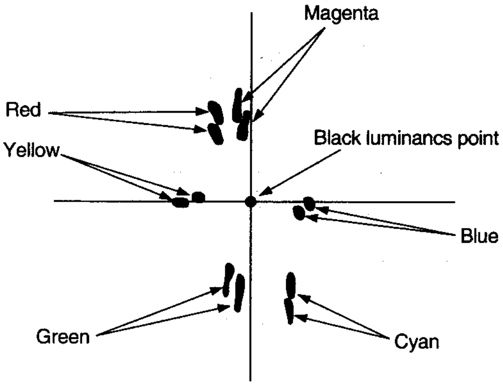
(adjustment method)
1) Set the adjustment address to 07 with the adjustment remote controller.
2) Change the adjustment data with the adjustment remote controller to match the white luminance point with the origin.
3) Press SAVE KEY to store the adjustment data in the memory
4) Set the adjustment address to 08 with the adjustment remote controller.
5) Change the adjustment data with the adjustment remote controller to match the white luminance point with the origin.
6) Press SAVE KEY to store the adjustment data in the memory
7) Repeat steps 2) through 6) until meet the specified value.


White luminance point
Black luminance point (or origin)
Match the white luminance point with the black luminance point (or origin).

1-8-18-2) C1 GAIN Adjustment

Subject	COLOR BAR CHART
Measurement Point	CST-10 BD VIDEO OUT
Measuring instrument	VECTORSCOPE
Adjustment Address	ADDRESS 09
Specified Value	Separate color luminance points become one.

(adjustment method)
1) Set the adjustment address to 09 with the adjustment remote controller.
2) Change the adjustment data so that the two separate color luminance points become one respectively.
3) Press SAVE KEY to store the adjustment data in the memory


Magenta
Red
Yellow
Black luminancs point
Blue
Green
Cyan

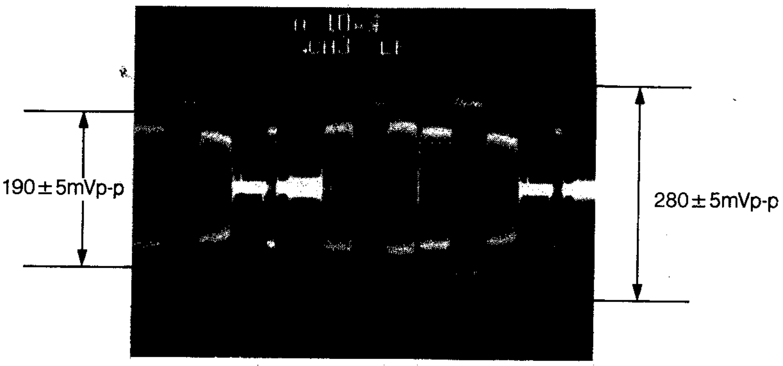
1-8-19) Color Reproduction Adjustment

1-8-19-1) Gain Adjustment

Subject	COLOR BAR CHART (5100° K)
Measurement Point	TP1 (CAM. C) OR TP10 (SIGNAL OUT)
Measuring instrument	OSCILLOSCOPE
Adjustment Address	ADDRESS 15 (R-Y GAIN) 14 (B-Y GAIN)
Specified Value	Red level: 280±5mVp-p Yellow level: 190±mVp-p

(adjustment method)

1) Set the adjustment address to 15 with the adjustment remote controller.
2) Change the adjustment data with the adjustment remote controller to set the Red signal level to 280±5mVp-p.
3) Press SAVE KEY to store the adjustment data in the memory
4) Set the adjustment address to 14 with the adjustment remote controller
5) Change the adjustment data with the adjustment remote controller to set the yellow signal level to 190±5mVp-p.
6) Press SAVE KEY to store the adjustment data in the memory
7) Perform "hue Adjustment"



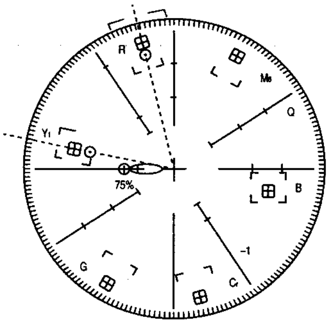
HORIZONTAL: 10μS/DIV
VERTICAL: 50mV/DIV

1-8-19-2) HUE Adjustment

Subject	COLOR BAR CHART (5100 K)
Measurement Point	CST-10 BD VIDEO OUT
Measuring instrument	VECTORSCOPE
Adjustment Address	ADDRESS 0B (R-Y HUE) 0C (B-Y HUE)
Specified Value	Red and Yellow luminance points are within vectorscope color frame.

(adjustment method)

1) Set the adjustment address to 0B with the adjustment remote controller.
2) Change the adjustment data with the adjustment remote controller to set the Red luminance point is within vectorscope Red frame.
3) Press SAVE KEY to store the adjustment data in the memory.
4) Set the adjustment address to 0C with the adjustment remote controller.
5) Change the adjustment data with the adjustment remote controller to set the Yellow luminance point is within vectorscope Yellow frame.
6) Press SAVE KEY to store the adjustment data in the memory
7) Set the oscilloscope to the normal mode and connect it to TP10 (CAM C) and confirm that the specified value of "3-18-1. Gain Adjustment" is satisfied. Change the data at the adjustment address 14 and 15 if the specified value is not met.



1-8-20) AUTO WHITE BALANCE check

Subject	COLOR BAR CHART (5100° K)
Measurement Point	CST-10 BD VIDEO OUT
Measuring instrument	VECTORSCOPE
Adjustment Address	ADDRESS 07 (B GAIN) 08 (R GAIN)
Specified Value	Line up the white luminance point with the black luminance point

(checking method)
1) Select adjustment address 00 with the adjustment remote controller
2) Confirm that the white luminance point matches with the origin (or the black luminance point) when shooting the color bar chart without the W4 filter.
3) Cover the lens with the W4 filter and confirm that the white luminance point matches with the origin (or the black luminance point) in about 4 seconds.
4) Change the data at the adjustment address 07 and 08 if the specified value is not met.

1-8-21) DIGITAL TITLE SYSTEM Adjustment

1-8-21-1) Title Oscillation Adjustment (TWB-10 BD)

Subject	All-black (Cover lens with black cap)
Measurement Point	VIDEO OUT in state of full set
Measuring instrument	Confined on monitor TV (Scan under on)
Adjustment Address	CT811 (on TWB-10 BD)
Specified Value	See FIG. 1-8-20-1

(adjustment method)
1) Press the memory button (S105 on CK-10 BD)
2) Adjust CT811 to FIG. 1-8-20-1

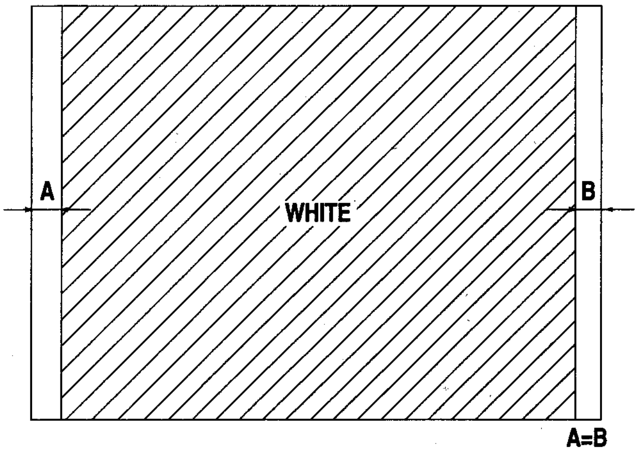


Fig. 1-8-20-1

1-8-21-2) Title A/D level adjustment (TWB-10 BD)

Subject	Arbitrary
Measurement Point	T-REF (Pin 2 of P8006 on TWB-10 BD)
Measuring instrument	Digital Voltmeter
Adjustment Address	RV811 (on TWB-10BD)
Specified Value	1.97±0.005Vdc

(adjustment method)
1) Adjust RV811 to 1.97±0.005Vdc

1-8-21-3) Character Position Adjustment (TWB-10 BD)

Subject	Play back
Measurement Point	E.V.F Monitor
Measuring Instrument	E.V.F Monitor
Adjustment Element	RV812
Specified Value	FIG. 1-8-20-2

(adjustment method)
1) Play back the Alignment tape (WR4-9NS) in the VTR Mode
2) Press the date (+) button (S8211 on VK-10 BD)
3) Adjust RV812 to FIG. 1-8-20-2

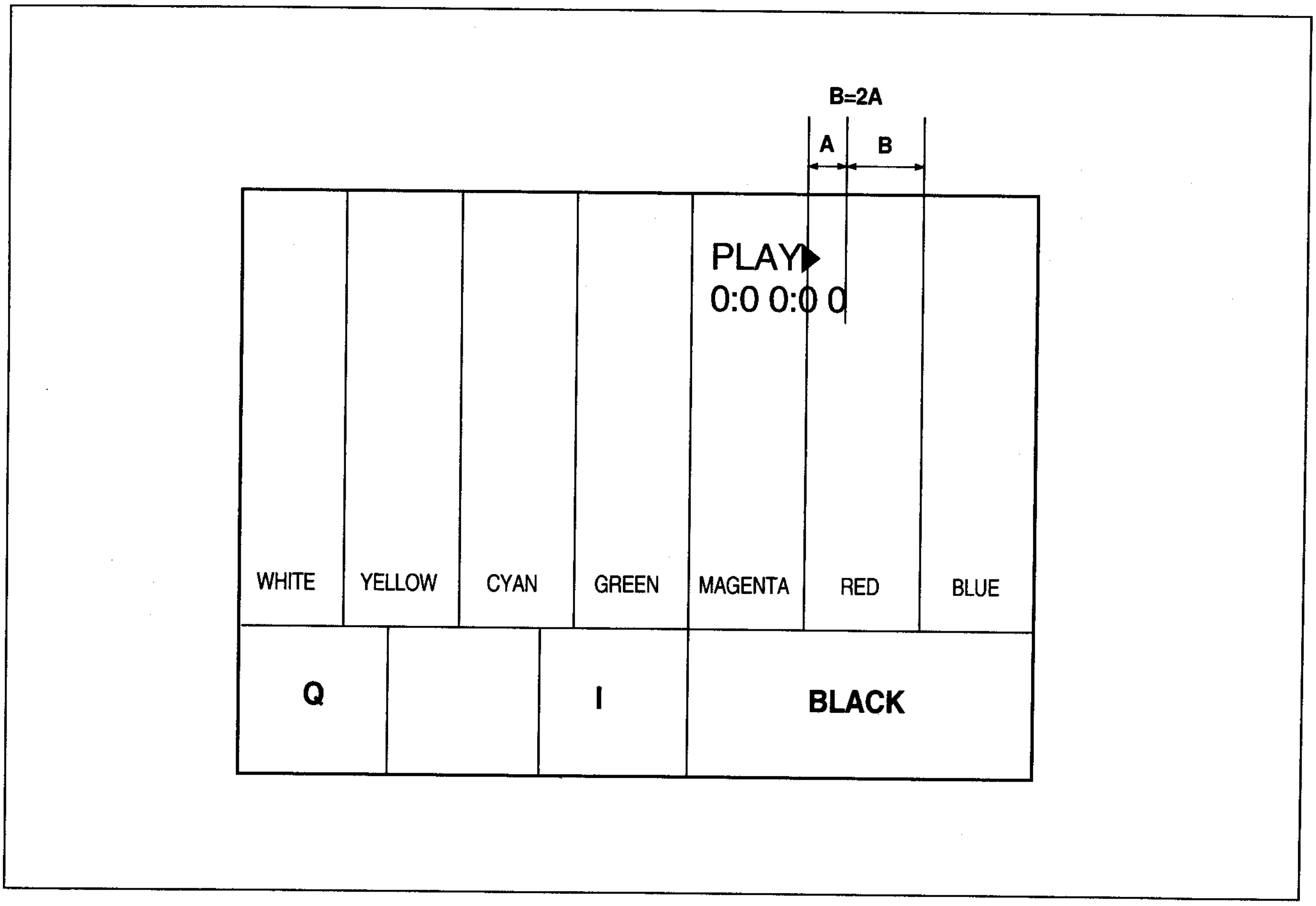

B=2A
A
B
PLAY▶
0:0 0:0 0
WHITE
YELLOW
CYAN
GREEN
MAGENTA
RED
BLUE
Q
I
BLACK

Fig. 8-20-2.

1-8-22) AF Adjustment

Subject	AF Adjustment CHART
Measurement Point	Be pictured by the measuring camera video out jack and focus ring
Measuring instrument	Calibrated Monitor B, Monitor A
Adjustment Point	Lens Adjust Screw
Tool	hexagonal Lench 1.27

Note:
—AF adjustment should be done in state of full set be assembled covers and a visible ray cut filter.
—Reference to appendix about AF adjustment set and jig

(adjustment method)
1) Position FOCUS S/W "MANUAL"
2) Adjust the camera position in order to accord the center of chart to the center of Monitor A screen.
3) fix the zoom lever at the end of TELE.
4) Revolve the focus ring from 0.6m position to be able to view the pattern of chart most cleanly
5) If the best pint position is set, remember the relation of No. 3 position on the focus ring and calibration on the Monitor TV B (reference to appendix). (the best pint position)
6) Set the FOCUS SW to "AUTO" and operate AF 2~3 times from & 0.6m position on focus ring each other.
7) In order that the center of "stop position from position" and "stop position from 0.6m position" is in 1mm tolerance from the best pint position of 5), adjust lens adjust screw (refence to Fig. 1-18-21) by the hexagonal lench.

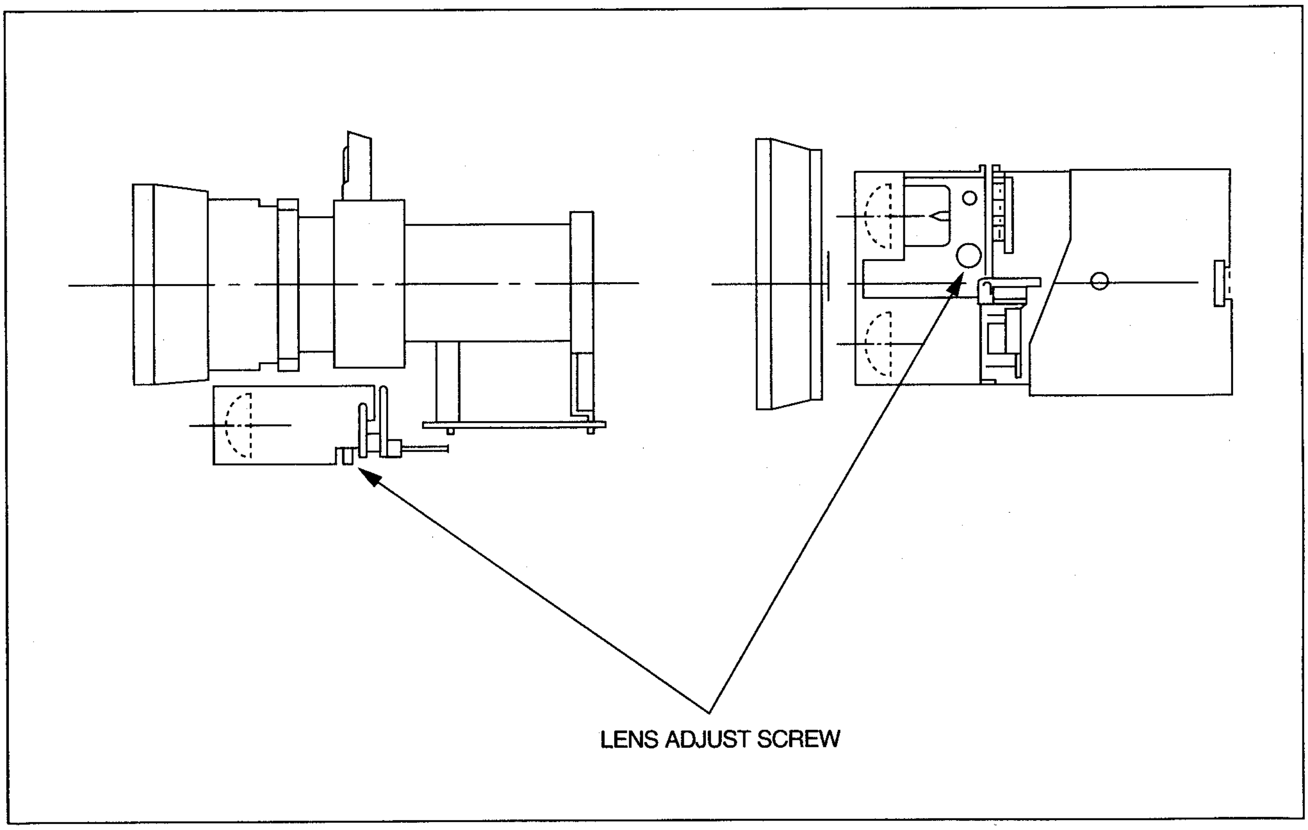
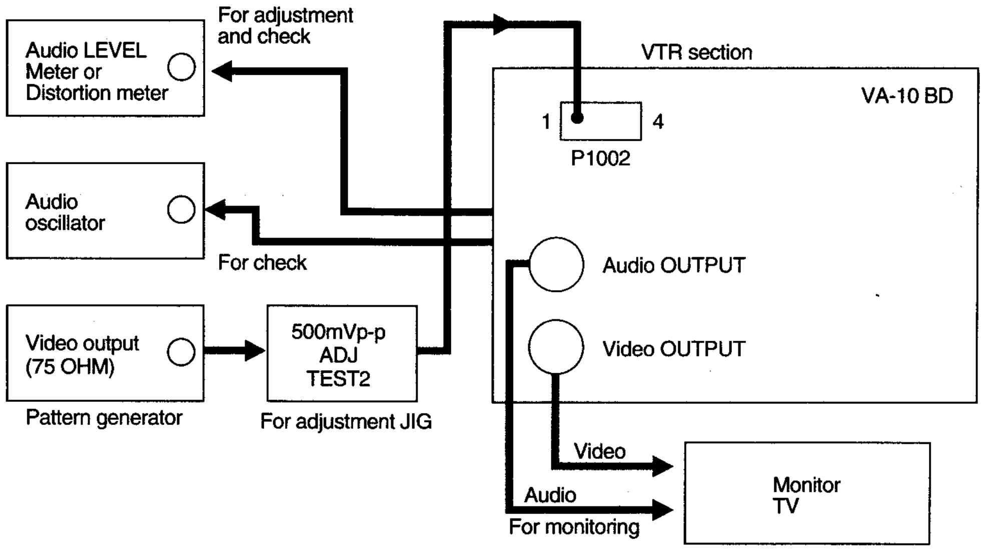
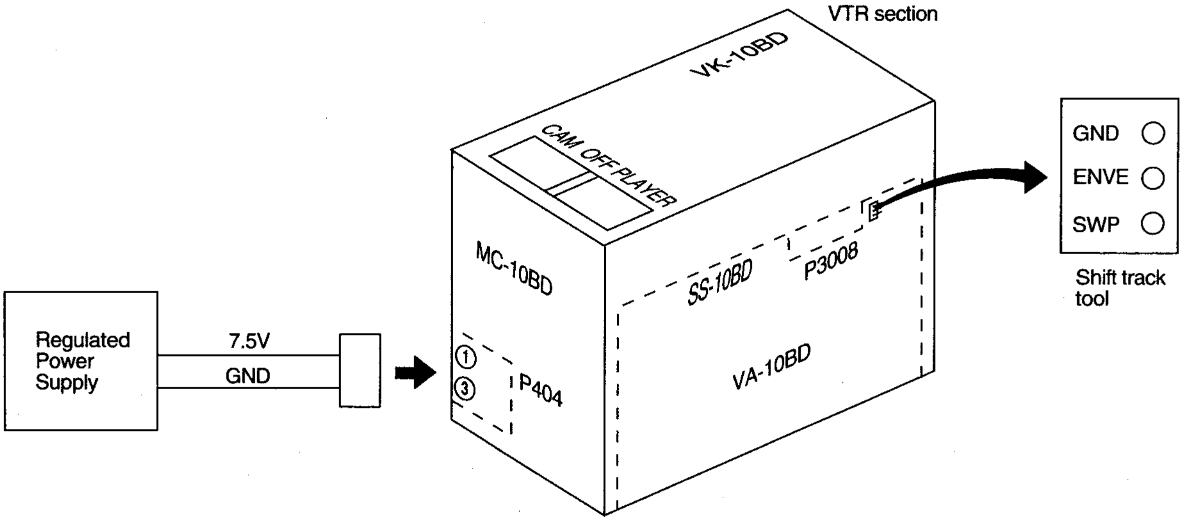


Fig. 1-8-21.

(Equipments connection when adjusting)


Audio LEVEL
Meter or
Distortion meter
For adjustment
and check
VTR section
VA-10 BD
1
4
P1002
Audio
oscillator
For check
Audio OUTPUT
Video output
(75 OHM)
500mVp-p
ADJ
TEST2
Video OUTPUT
Pattern generator
For adjustment JIG
Video
Audio
For monitoring
Monitor
TV

Adjustment and check


VTR section
VK-10BD
CAM OFF PLAYER
MC-10BD
SS-10BD
P3008
VA-10BD
GND
ENVE
SWP
Shift track
tool
Regulated
Power
Supply
7.5V
GND
①
③
P404

Power input connection

Fig. 2-1) Connection diagram

Note: 1) Set the power switch in CAM mode when adjust the video system
2) Use the Video Adjustment JIG and put the test 2 Mode
3) Reference GND point is TP101 on VA-10BD when adjustment

(Setup for adjustment)
For adjustment of the VTR section, the video signal from the pattern geneator is used as the adjustment signal.
Therefore, it is necessary that this video output signal is within the specified level.
Connect the oscilloscope to pattern generator output.
Confirm that the amplitude of the sync signal of the video signal is about 0.6V, and that the amplitude of the video section is about 1.4V, and that the amplitude of the burst signal is about 0.6V and is flat and that the level ratio of the burst signal and the "red" signal is 0.30:0.66
The video signal to be used for the VTR adjustment is shown below.

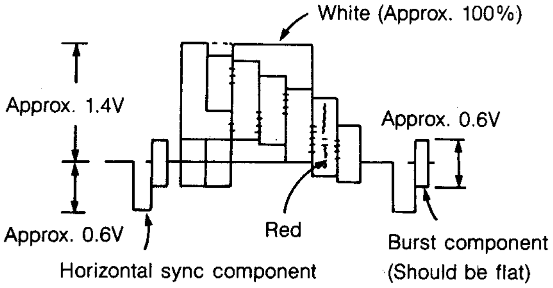
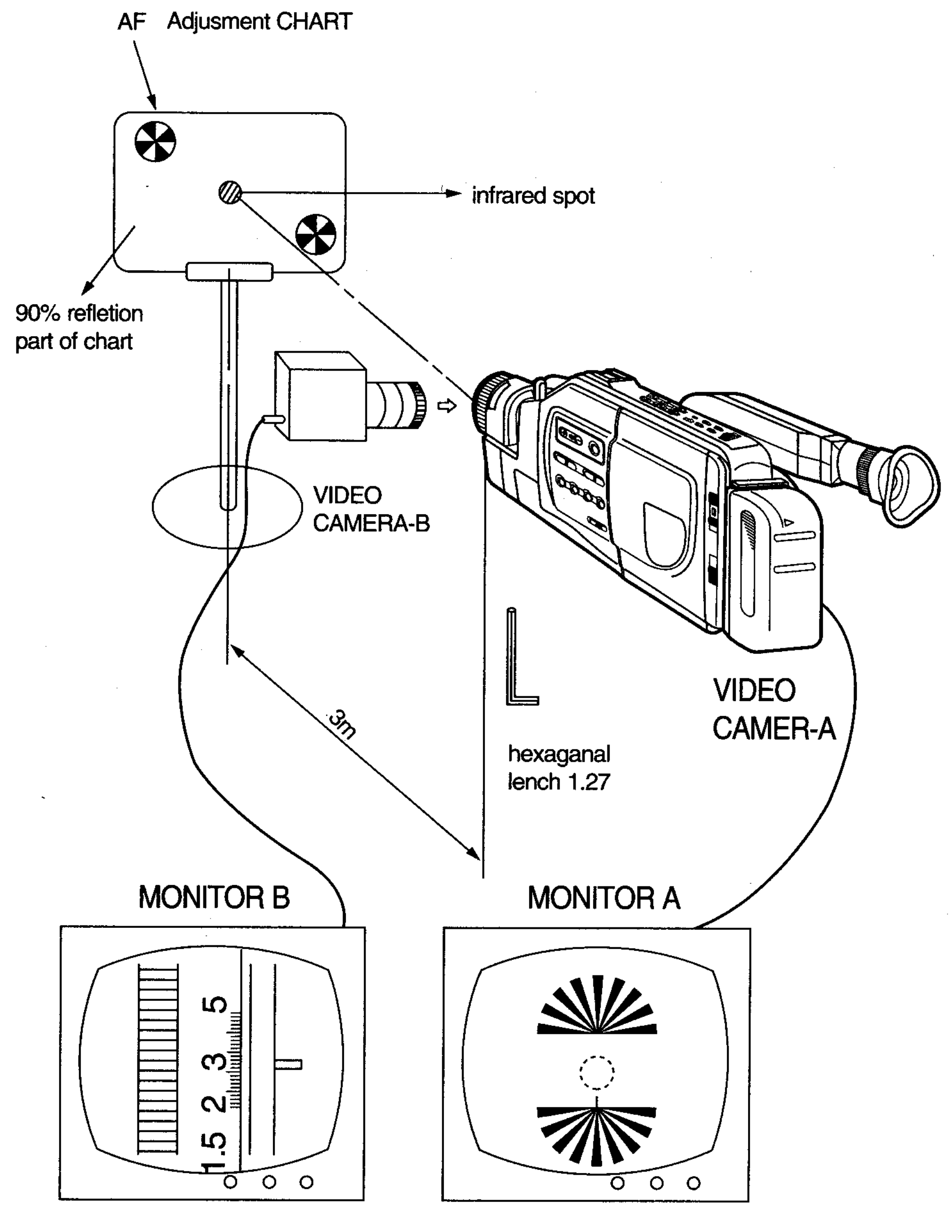

White (Approx. 100%)
Approx. 1.4V
Approx. 0.6V
Approx. 0.6V
Red
Horizontal sync component
Burst component
(Should be flat)

Fig. 2-2) Color bar signal from the pattern generator

(Configuration) Reference to Fig. 1-8-22

- Installation of lens (in state of full set) in VIDEO CAMERA-A for AF adjustment.
- Position the chart for AF adjustment at a distance of 3m from VIDEO CAMERA-A.
- Irradiate the infrared spot of AF unit to 90% reflection part of the chart (not including siemens pattern of chart)
- Output the picture of VIDEO CAMERA-A to the monitor TV-A.
- The VIDEO CAMERA-B is used for magnifing the calibration on the VIDEO CAMERA-A.
- Output the picture of VIDEO CAMERA-B to the monitor TV-B.
- Calibrate on the monitor TV-B screen in pitch of 0.5mm
- Position the zoom level of the VIDEO CAMERA-A at the end of TELE.


AF Adjusment CHART
infrared spot
90% refletion part of chart
VIDEO CAMERA-B
3m
hexaganal lench 1.27
VIDEO CAMER-A
MONITOR B
1.5 2 3 5
MONITOR A

2) VIDEO/AUDIO BLOCK ADJUSTMENTS

2-1) THE GENERAL

(Equipments)
1) Monitor TV
2) Oscilloscope 2 phenomena, band 30MHz or wider, delay mode.
   (Use 10:1 probe unless otherwise specified)
3) Frequency counter, Universal counter
4) Pattern generator with video output terminal
5) Regulated power supply
6) Alignment tape
7) MP tape
8) Audio level meter or Distortion meter
9) Audio Oscillator
10) Power input tool and shift track tool.

(Alignment tape)

For playback frequency characteristics adjustment: (WR5-6C) or (WR4-2C)
For operation check and adjustment: (WR5-5CSP) or (WR4-9CS)

Name	Contents	Application
Playback frequency characteristics (WR5-6C), (WR4-2C)	1. Recorded area: Video 2. Recorded contents: RF Sweep 0 to 10MHz 3. Marker: 1, 4.43, 5.5, 7MHz	Frequency characteristics adjustment
Operation check and adjustment (WR5-5CSP), (WR4-9CS)	1. Recorded area: PCM to video 2. Recorded contents: Color bar, monoscope (SP) Audio signal (FM), PCM audio signal	Operation check and adjustment

2-2) VIDEO SYSTEM ADJUSTMENTS

When adjust the video system, follow the order below in principle. The color video signal supplied from the pattern generator is used as the video input signal for the video system ajustment of REC or EE mode.
Confirm that the level of sync and color burst signals meet the specification for setup as shown in Fig. 2-2.

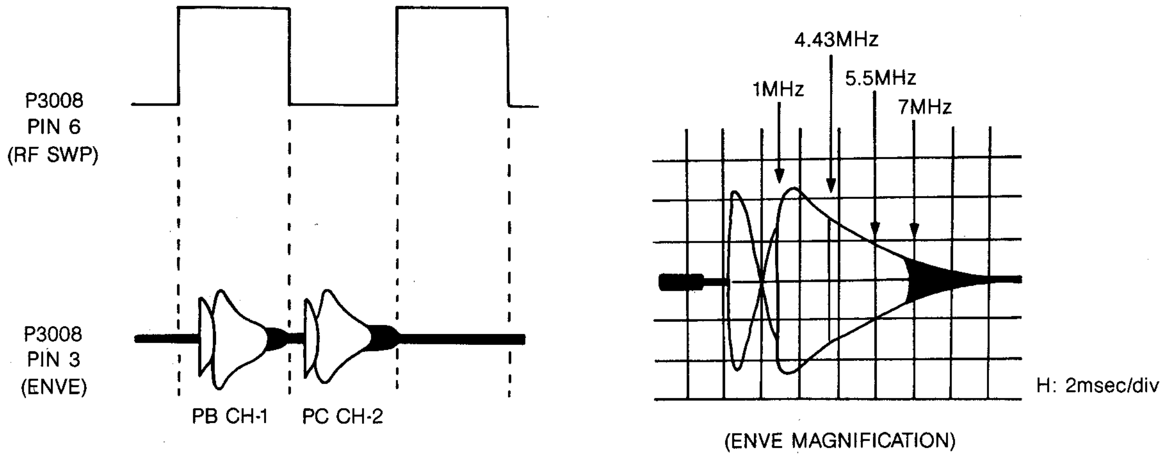
Adjustment order:

1) Playback frequency characteristics adjustment (HA-10BD)
2) Flying erase check (HA-10BD)
3) EE output level adjustment (VA-10BD)
4) IR adjustment (VA-10BD)
5) Y/C seperation adjustment (VA-10BD)
6) Y emphasis input level adjustment (VA-10BD)
7) REC Y FM carrier frequency adjustment (VA-10BD)
8) REC Y FM recording current adjustment (SS-10BD)
9) Chroma emphais adjustment (VA-10BD)
10) REC chroma recording current adjustment (VA-10BD)
11) Playback deemphasis input level adjustment (VA-10BD)
12) Playback output level adjustment (VA-10BD)
13) REC Y FM deviation adjustment (VA-10BD)
14) JOG Color phase TH/DL Lock adjustment (VA-10BD)

2-2-1) Playback Frequency Characteristics Adjustment (HA-10BD) Check elements for CH-B are shown in ( ).

Mode	Playback
Alignment Tape	For frequency characteristics check (WR5-6C) or (WR4-2C)
Adjustment Point	RV191, (RV192) IN HA-10BD
Oscilloscope CH-1	SS-10BD P3008 PIN 3 (shift track tool)
External Trigger	SS-10BD P3008 PIN 6 (shift track tool)
Trigger Slope	+, (−)

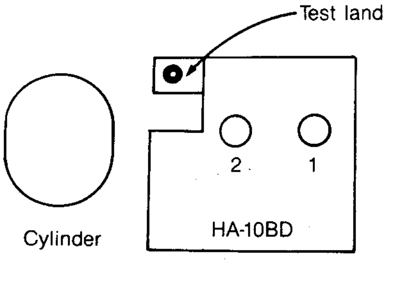
Adjusting method:
Adjust with RV191, (RV192) so that the ratio between 4.43MHz level and 5.5MHz level becomes 4:3 respectively



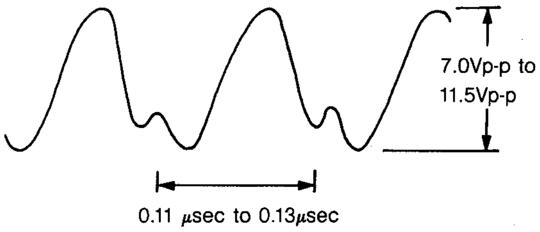
2-2-2) Flying Erase Check (HA-10BD)

Mode	REC
Input Signal	Arbitrary
Check Point	HA-10BD TEST LAND (Refer to Fig. Shown below)

Checking method:
Confirm that the oscillation frequency is 7.5MHz to 9.0MHz, and that the oscillation voltage is 7.0Vp-p to 11.5Vp-p.


Test land
2
1
Cylinder
HA-10BD
Deck

Test land position for flying Erase checking

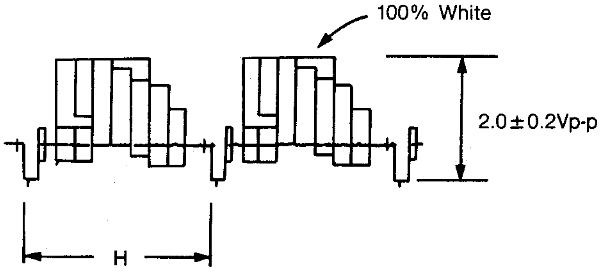

7.0Vp-p to
11.5Vp-p
0.11 μsec to 0.13μsec

Flying erase check

2-2-3) EE Output Level Adjustment (VA-10BD)

Mode	EE or REC
Input Signal	Color bar with 100% White
Check Point	TP103

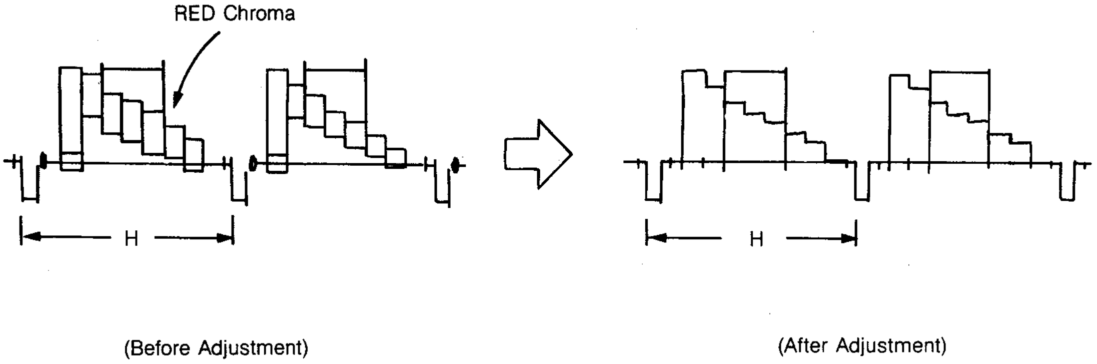
Adjusting method:
Adjust with RV109 to 2.0±0.2Vp-p


100% White
2.0±0.2Vp-p
H

2-2-4) IR Adjustment (VA-10BD)

Mode	EE or REC
Input Signal	Color bar with 100% White
Check Point	TP105

Adjusting method:
Connect TP102 and TP108.
Adjust with RV104 so that the amplitude (residual chroma level) of red (second from right) becomes minimum (below 50mVp-p).
Disconnect the TP102 and TP108 after adjustment.

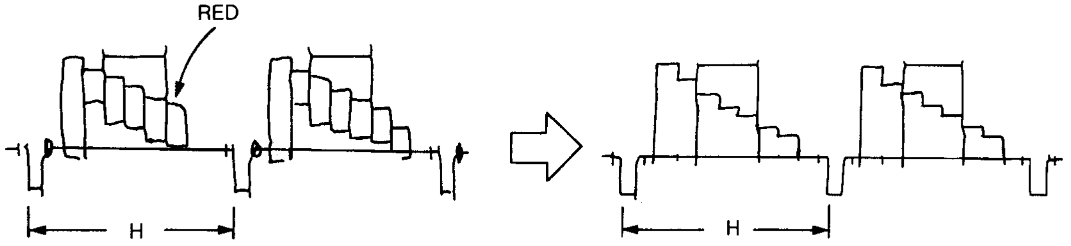


(Before Adjustment) (After Adjustment)

2-2-5) Y/C Seperation Adjustment (VA-10BD)

Mode	EE or REC
Input Signal	Color bar with 100% White
Check Point	TP104

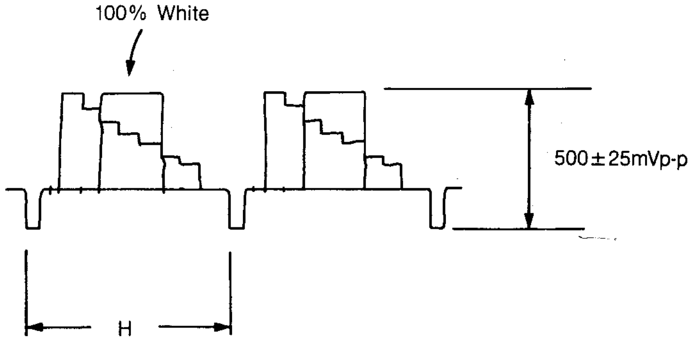
Adjusting method:
Adjust with RV108 so that the amplitude (residual chroma level) of RED becomes minimum.
Adjust with TP107 so that the amplitude (residual chroma level) of RED becomes minimum (below 20mVp-p).



2-2-6) Y Emphasis Input Level Adjustment (VA-10BD)

Mode	EE or REC
Input Signal	Color bar with 100% White
Check Point	TP109

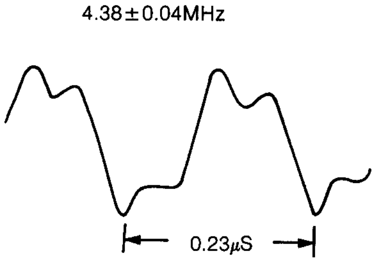
Adjusting method:
Adjust with RV105 to 500±25mVp-p.



2-2-7) REC Y FM Carrier Frequency Adjustment (VA-10BD)

Mode	EE or REC
Input Signal	No Signal
Check Point	TP121 (SS-10BD)

Adjusting method:
Adjust with RV102 to 4.38±0.04MHz
Note: If adjusted to 4.39MHz in no signal state, the frequency is set to 4.20MHz when there is a signal.

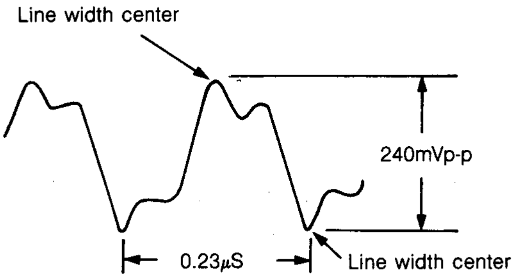


Y FM carrier frequency adjustment

2-2-8) REC Y FM Recording Current Adjustment (SS-10BD)

Mode	EE or REC
Input Signal	No Signal
Check Point	TP121 (SS-10BD)

Adjusting method:
Adjust with RV121 to 240±5mVp-p

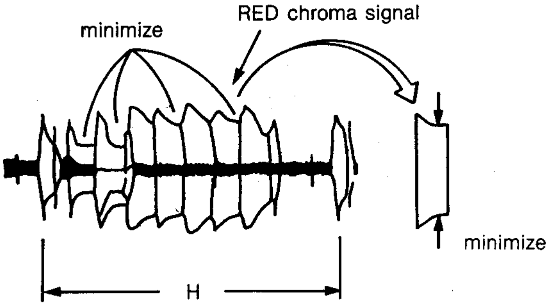

Line width center
240mVp-p
0.23μS
Line width center

REC Y recording current adjustment

2-2-9) Chroma Emphasis Adjustment (VA-10BD)

Mode	EE or REC
Input Signal	Color bar with 100% White
Check Point	TP132

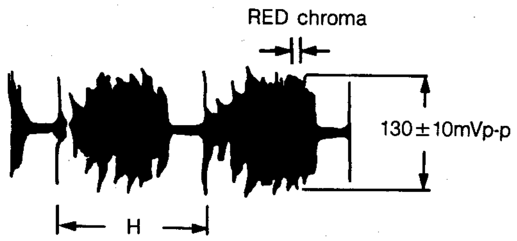
Adjusting method:
Adjust with Z302 so that the amplitude of RED chroma signal becomes minimum.


minimize
RED chroma signal
minimize
H

2-2-10) REC Chroma Recording Current Adjustment (VA-10BD)

Mode	EE or REC
Input Signal	Color bar with 100% White
Check Point	TP131

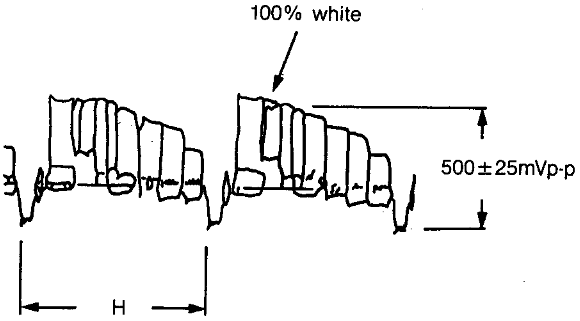
Adjusting method:
Adjust with RV131 so that the amplitude of RED chroma becomes 130±10mVp-p



2-2-11) Playback Deemphasis Input Level Adjustment (VA-10BD)

Mode	PB (Playback)
Input Signal	Playback Signal of WR5-5CSP or WR4-9CS
Check Point	TP106

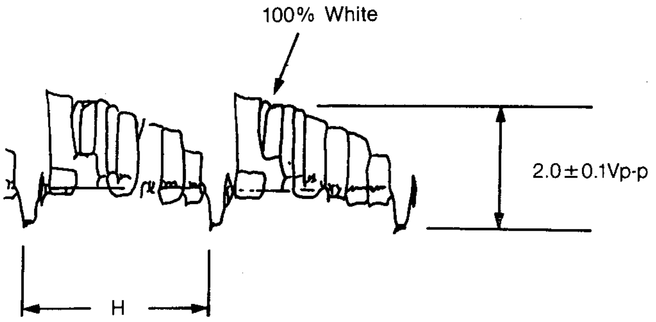
Adjusting method:
Adjust with RV101 to 0.5±0.025 Vp-p



2-2-12) Playback Output Level Adjustment (VA-10BD)

Mode	PB
Input Signal	Playback Signal of WR5-5CSP or WR4-9CS
Check Point	TP103

Adjusting method:
Adjust with RV106 to 2.0±0.1Vp-p

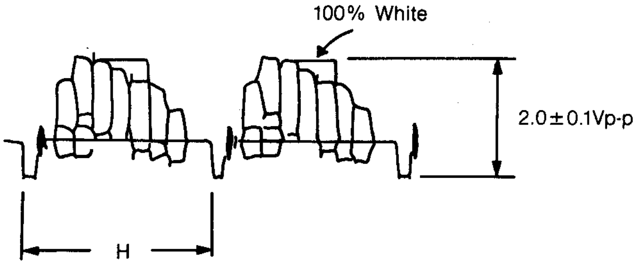


2-2-13) REC Y FM Deviation Adjustment (VA-10BD)

Mode	Self-recording and playback
Input Signal	Color bar with 100% White
Check Point	TP103

Adjusting method:
1) Set the CAM MODE and input the signal
2) Record the input Signal
3) Playback the recorded Signal
4) Check the playback level.
It should be within 2.0±0.1Vp-p
5) When the level does not meet the specification, turn RV103 on the VA-10BD as follows, and repeat step 2) to 4)

	Rotating direction of RV103
When larger than specified value	Clockwise (↷)
When smaller than specified value	Counterclockwise (↶)



2-2-14) JOG Color Phase TH/PL Adjustment

Mode	PB
Input Signal	Playback signal of WR5-5CSP or WR4-9CS
Check Point	RV132 (IC132 16 PIN)

Adjusting method
Adjust with RV132 to DC 1.6±0.1V

2-3) AUDIO SYSTEM ADJUSTMENTS

Perform adjustment with the color bar signal used as the video input signal.

(Connection of audio measuring instruments)
In addition to the video system measuring instruments, connect the audio system measuring instruments as shown in the figure below, and set the power switch to the video position for adjustment.

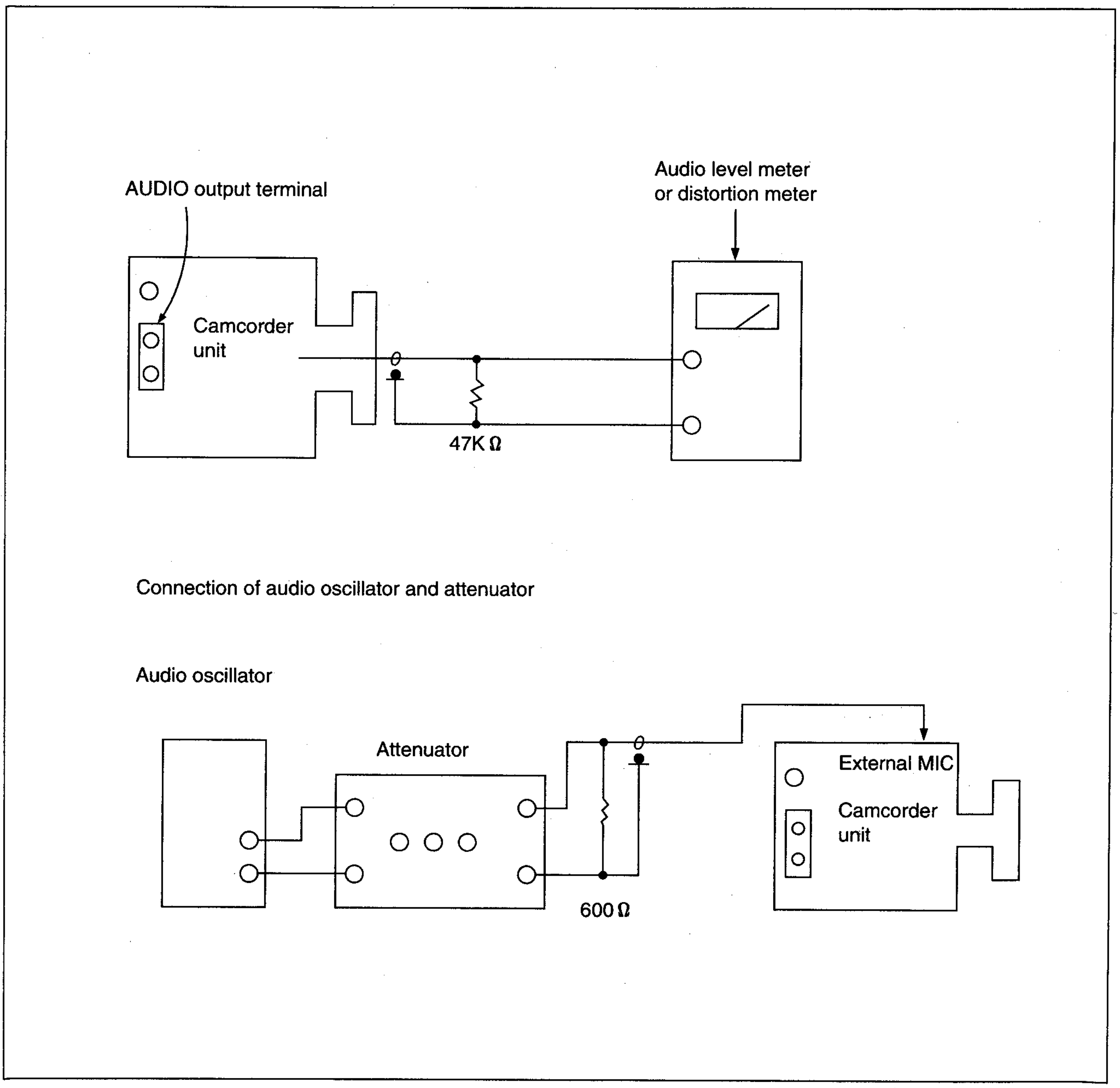

AUDIO output terminal
Audio level meter or distortion meter
Camcorder unit
47KΩ
Connection of audio oscillator and attenuator
Audio oscillator
Attenuator
External MIC
Camcorder unit
600Ω

Fig. 4-1

2-3-1) Io Adjustment (VA-10BD)

Mode	Playback
Playback Tape	For operation check (WR5-5CSP) or (WR4-9CS)
Measurement Point	TP203 (VA-10 BD)
Measuring Instrument	Oscilloscope

Adjusting method:

1) Connect the oscilloscope to TP203 and TP101 on the VA-10 BD, then playback the opertion check tape.
2) Set the oscilloscope to AC 50mV/div, 0.5 uses/div and adjust RV201 on the VA-10 BD so that playback FM waveform has the same amplitude in high frequency range and low frequency range.
3) Expanding sweep of the time base to 0.1 usec/div and check the waveform.

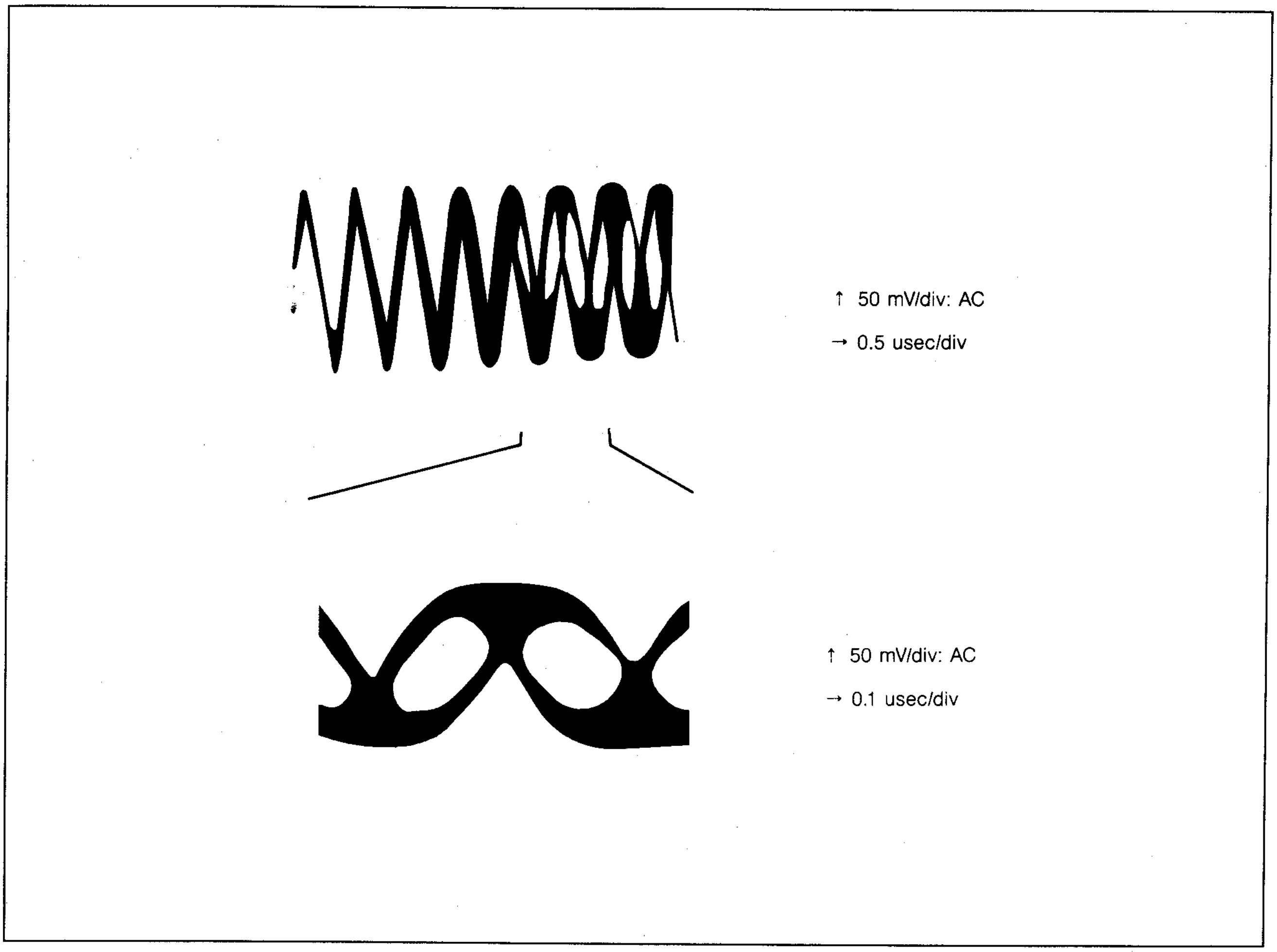


Fig. 4-2

2-3-2) Deviation Adjustment (VA-10BD)

Mode	Playback
Playback Tape	For operation check (VR5-5CSP) or (WR4-9CS)
Measurement Point	AUDIO output terminal (TP201)
Measuring Instrument	Audio level meter
Specified Value	−7.5±2dBs

Adjusting method:
1) Connect the Aduio level meter to Audio output terminal (PJ201) on the VA-10 BD then playback the operation check tape.
2) Adjust RV202 on the VA-10 BD so that playback output level is −7.5±2dBs.

2-3-3) E-E Output Level Check

Mode	E-E
Input Signal	400Hz, −66dBs
Measurement point	AUDIO output terminal (TP201)
Measuring Instrument	Audio level meter
Specified Value	−7.5±2dBs

Checking method:
1) Make sure that the audio output level is −7.5±2dBs

2-3-4) Overall Level Characteristics Check

Mode	Self-recording and playback
Input Signal	400Hz, −66dBs
Measurement point	AUDIO output terminal (TP201)
Measuring Instrument	Audio level meter
Specified Value	−7.5±3dBs

Checking method:
1) Record the input signal.
2) Playback the recorded section.
3) Make sure that the audio output level is −7.5±3dBs.

2-3-5) Overall Frequency Characteristics Check

Mode	Self-recording and playback
Input Signal	Ⓐ 400Hz, −76dBs Ⓑ 30Hz, −76dBs Ⓒ 15kHz, −76dBs
Measurement point	AUDIO output terminal
Measuring Instrument	Audio level meter
Specified Value	400Hz: 0 dBs (REF) 30Hz: less than −10dBs 14kHz: less than −5 dBs

Checking method:
1) Record the input signal Ⓐ through Ⓒ in order.
2) Playback the recorded sections.
3) With the 400Hz playback ouput level as 0dB confirm that the playback output level of 30Hz and 15kHz is less than −10dBs.

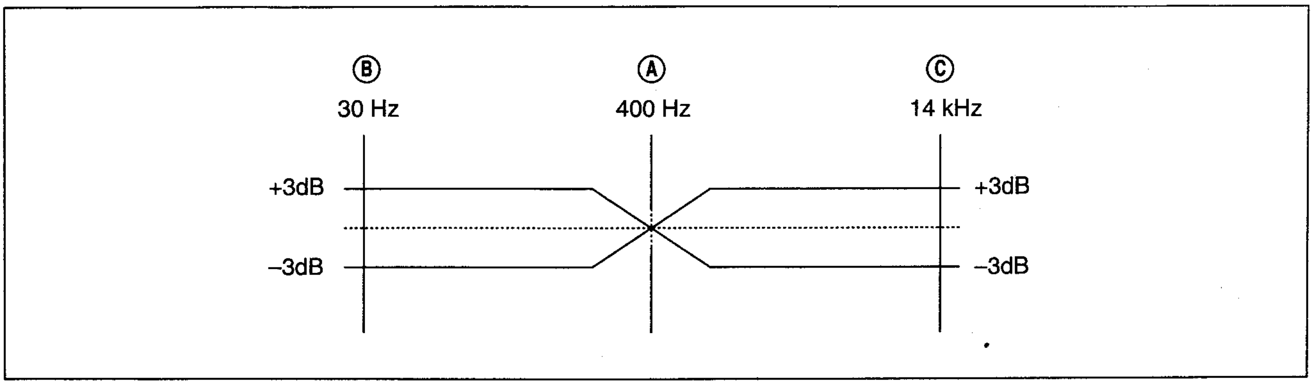


Fig. 4-3 AFM overall frequency characteristcs

2-3-6) Overall Distortion Check

Mode	Self-recording and playback
Input Signal	400Hz, −66dBs
Measurement point	AUDIO output terminal (PJ201)
Measuring Instrument	Distortion meter
Specified Value	Less than 2% *1

checking method:
1) Record signal
2) Playback the recorded section.
3) Confirm that the distortion is less than 2% *1
*1 Value when 200Hz-6kHz 18dB/oct BPF is used.
When the filter is not used. . . . . .less than 3%

2-3-7) Overall Noise Level Check

Node	Self-recording and playback
Input Signal	No signal (shorting plug is inserted into EXT Mie input jack)
Measurement point	AUDIO Output terminal
Measuring Instrument	Audio level meter
Specified Value	Less than −50dBs *2

Checking method:
1) Record the input signal.
2) Playback the recorded section.
3) Make sure that the noise level is less than −50dBs (*2)
*2; Value when IHF-A hearing correction filter is used

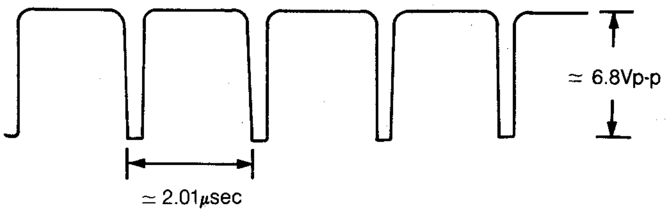
3) SYSTEM CONTROL AND SERVO SYSTEM ADJUSTMENTS

(Adjustment order)
1) DC-DC oscillation Frequency Adjustment (SS-10BD)
2) Switching position adjustment (SS-10BD)
3) Still Adjustment (SS-10BD)
4) Crystal Oscillation Frequency Adjustment for Clock (MC-10BD)

3-1) DC-DC oscillation frequency Adjustment (SS-10BD)

Mode	PB
Input Signal	Playback Signal of WR5-5CSP or WR4-9CS
Check Point	TP301

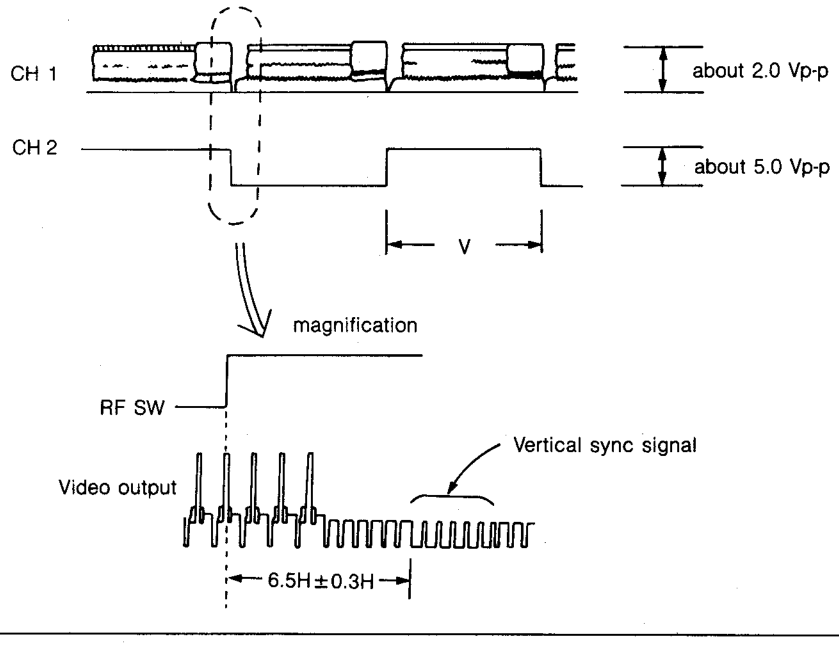
Adjusting method:
1) Take off the DC-DC shield case in SS-10BD
2) Playback the alignment tape WR5-5CSP or WR4-9CS
3) Connect the frequency counter to TP301
4) Adjust with RV311 to 479.89±5KHz


≃ 6.8Vp-p
≃ 2.01μsec

3-2) Switching Position Adjustment (SS-10BD)

Mode	PB
Input Signal	Playback Signal of WR5-5CSP or WR4-9CS
Check Point	CH-1: TP103 (VA-10BD)
	CH-2: P3008.6 (SWP) (Shift track tool)

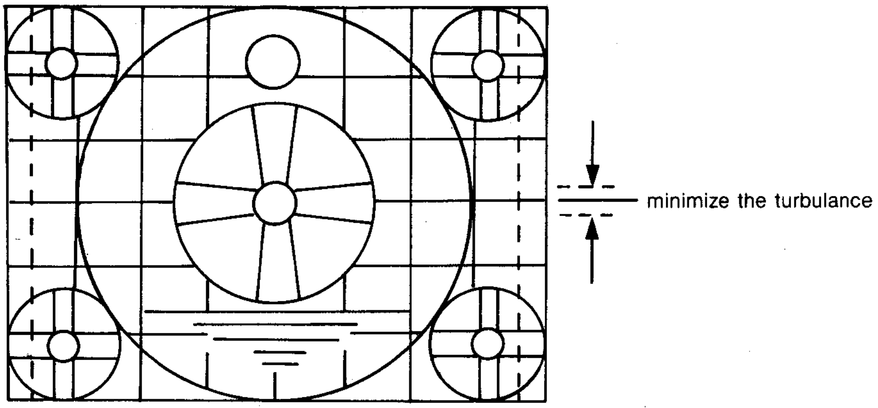
Adjusting method:
Adjust vertical sync signal to 6.5H from the rising edge (or falling edge) of the RF SW P with RV302.


CH 1
about 2.0 Vp-p
CH 2
about 5.0 Vp-p
V
magnification
RF SW
Vertical sync signal
Video output
6.5H±0.3H

3-3) Still Adjustment (SS-10BD)

Mode	PB
Input Signal	Playback Signal (Monoscope portion) of WR5-5CSP
Check Point	Monitor Screen

Adjusting method:
1) Playback the alignment tape WR5-5CLP or WR4-9CL
2) Press "still" key when the monoscope signal comes out on Monitor screen
3) Adjust with RV301 so that the turbulance width of the conter line of the monoscope signal on Mintor screen becomes minimum. (refer to Figure shown below)
4) Press the "still" key again (PB mode) and press it again (still mode) after adjustment for confirmation of the turbulance checking.
5) Repeat steps 1)~4) when the turbulance comes out.



3-4) Crystal Oscillation Frequency Adjustment For Clock (MC-10BD)

Mode	Arbitray
Input Signal	Arbitrary
Check Point	TP001 (Test land)

Adjusting method:
1) Short the R076.
2) Adjust with CT001 to 488.281±0.02 μsec.
3) Remove the R076 after adjustment.

4) TAPE PATH ADJUSTMENT

(The Track Shift Mode)
In the 8 mm video system, instantaneous tape speed control is performed using four kinds of pilot signals, and high-precision tracking is achieved through the ATF (Automatic Track Finding) system. This makes a tracking control knob unnecessary and allows for precise tracing.
On the other hand, however, tape path adjustment presents some difficulties when the ATF system is used. Namely, since the ATF system will automatically compensate to some degree for head tracing errors, thorough adjustment is not possible. This can be solved by setting the track shift mode for tracking fine adjustment. The ATF will be compulsorily activated, shifting the tracking amount by a fixed amount (approx. 1/3) and thus making tracking fine adjustment easy. Furthermore, no track shift jigs are required.

(Note on Adjustment of No.7 Guide (TG-7))
The height adjustment screw for No.7 guide (TG-7) is located at some distance from the guide (refer to Fig. 4-2). Therefore, when performing section 4-6. No.7 Guide (TG-7) Adjustment it is convenient to use the alignment tape for tracking (servicing tools No.1), modified as follows, and perform adjustment in playback mode.

4-1. TRACK SHIFT MODE SETTING

(Setting Procedure)
1) Short-circuit Pins ① and ④ of P3008 on the SS-10 board.
2) Playback an alignment tape for tracking adjustment.

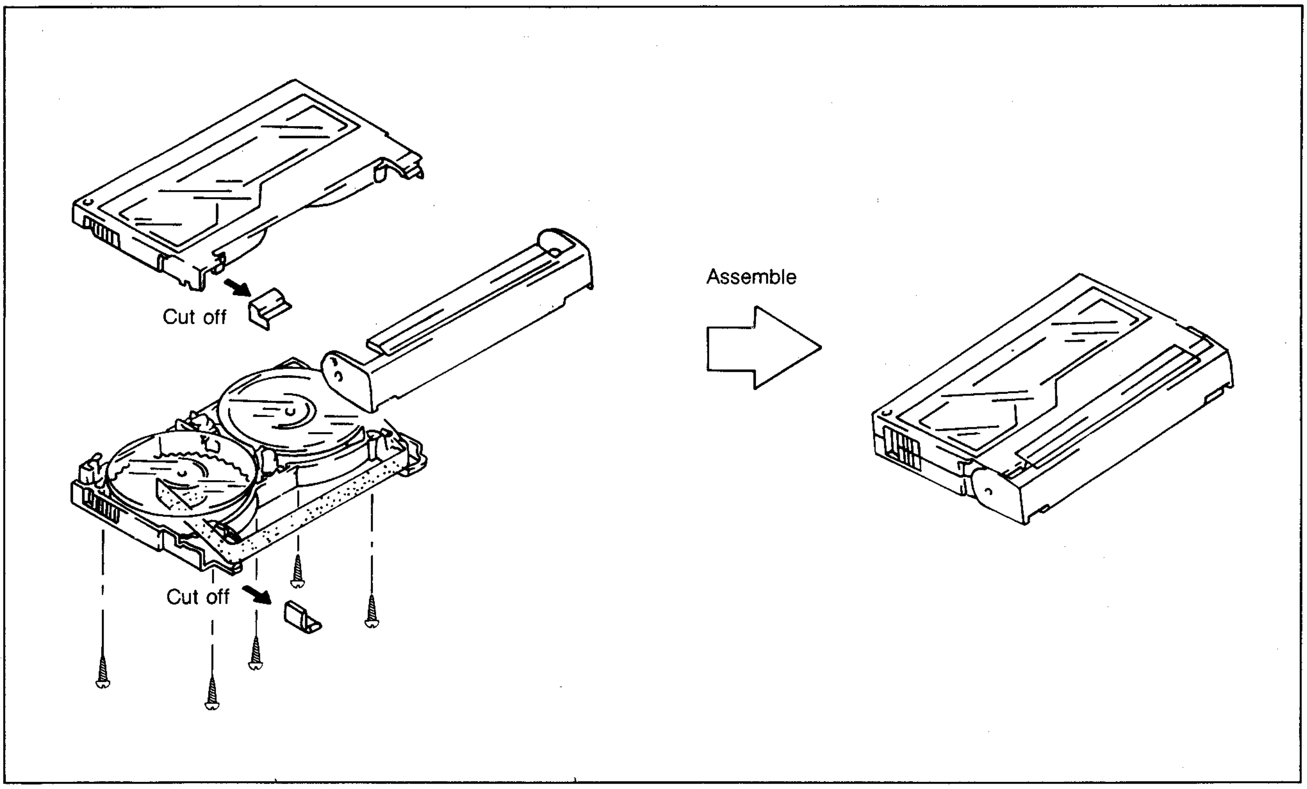


Fig. 4-1.

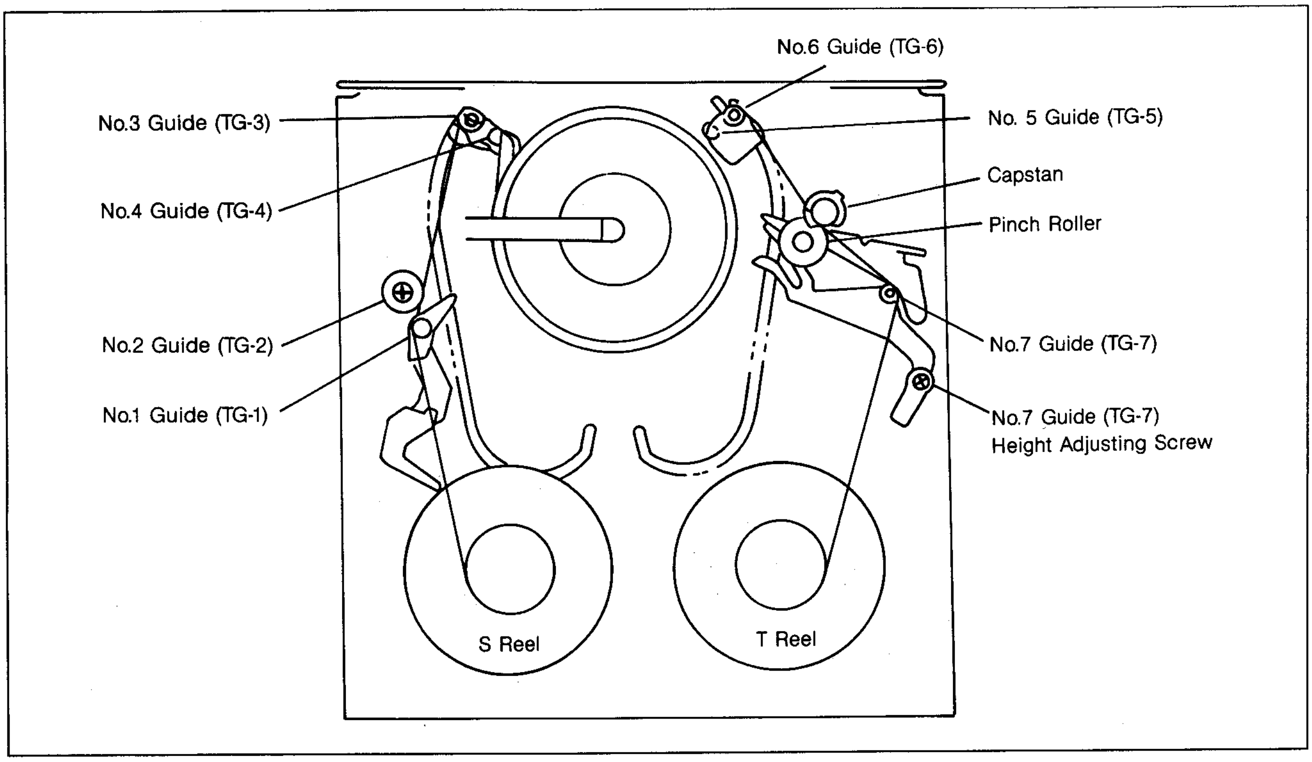

No.6 Guide (TG-6)
No.3 Guide (TG-3)
No. 5 Guide (TG-5)
Capstan
No.4 Guide (TG-4)
Pinch Roller
No.2 Guide (TG-2)
No.7 Guide (TG-7)
No.1 Guide (TG-1)
No.7 Guide (TG-7)
Height Adjusting Screw
S Reel
T Reel

Fig. 4-2

4-2) PREPARATIONS FOR ADJUSTMENT

Mode	
Signal	Alignment Tape (Servicing tools No.1) (NTSC; WR5-1NP) (PAL: WR5-1CP)
Measuring point	CH1: PB RF (P3008 ③ SS-10) GND (P3008 ① SS-10) CH2: RF SWP (P3008 ⑥ SS-10)
Measuring equipment:	Oscilloscope

Checking method:

1) Clean tape path surfaces (tape guides, drum, capstan shaft, pinch roller) (See Fig. 4-2).
2) Playback the alignment tape for tracking adjustment (Servicing tools No.1)
3) Confirm that both the entrance and exit side RF waveforms of the oscilloscope are flat (See Fig. 4-3). If they are not, adjust as follows.

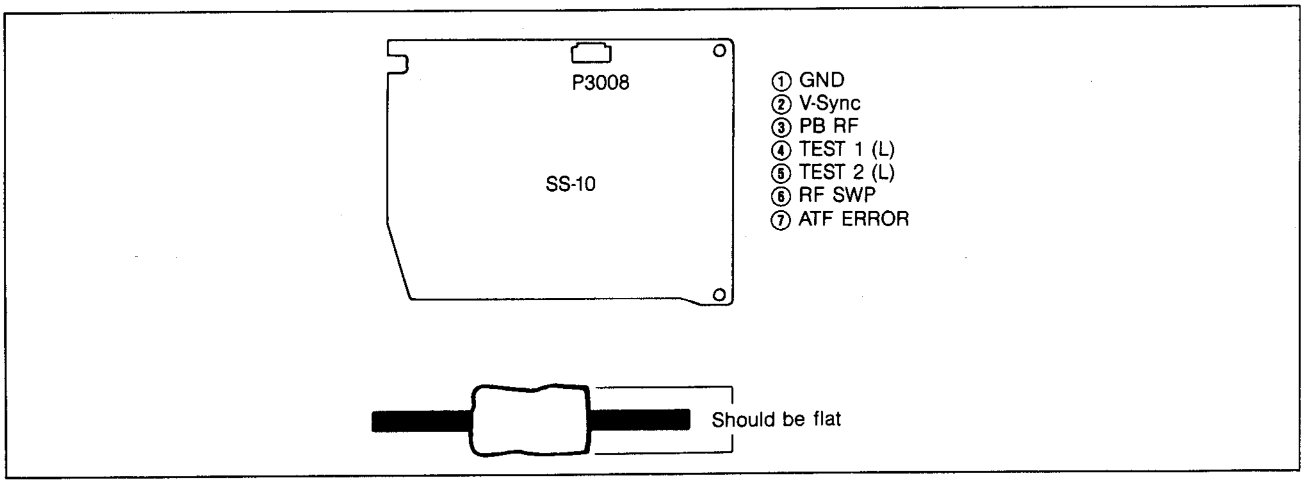

P3008
SS-10
① GND
② V-Sync
③ PB RF
④ TEST 1 (L)
⑤ TEST 2 (L)
⑥ RF SWP
⑦ ATF ERROR
Should be flat

Fig. 4-3

4-3) TRACKING ADJUSTMENT (See Fig. 4-4).

1) Playback the alignment tape for tracking adjustment.
2) Put a screwdriver through the hole ①, and loosen the lockscrew ② slightly. Turn the guide No.3 (TG-3) ③to make the waveform on inlet side flat.
3) Put a screwdriver through the hole ④, and loosen the lockscrew ⑤ slightly. Turn the guide No.6 (TG-6) ⑥ to make the waveform on outlet side flat.

Note: Take care not to loosen lockscrews too much, since guides come loose easily.

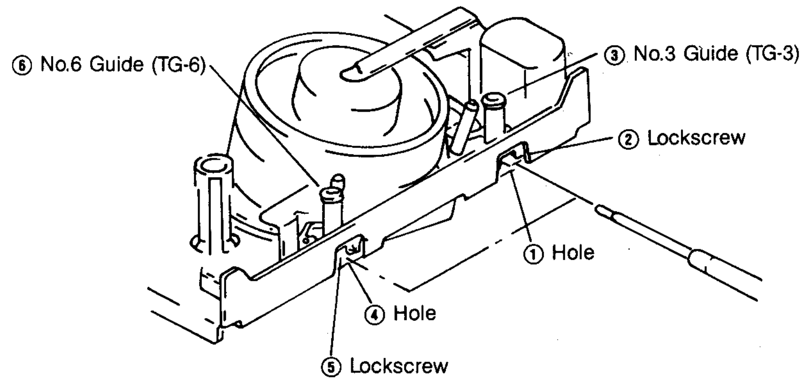
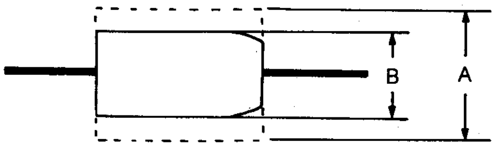


Fig. 4-4

4-4) TRACKING FINE ADJUSTMENT (See Figs. 4-4. and 4-5.)

1) Playback the alignment tape for tracking adjustment and set the track shift mode.
2) Confirm whether the waveform is flat. If it is not, turn the No.3 (TG-3) and No.6 (TG-6) guides so that it becomes flat.
3) Fix the No.3 guide ③ by tightening its lockscrew ②. Then confirm that the exit side waveform has not changed.

Note: The set screws ② and ⑤ should be tightened with a tightening torque of approx. 200g·cm±10%.
If tightened too much, there is danger of damaging the thread.



B=2/3A~3/4A

Fig. 4-5

4-5) No.2 GUIDE (TG-2) ADJUSTMENT

When the No.2 guide has been turned or replaced, perform height presetting before this adjustment.

4-5-1) No.2 guide (TG-2) Height Presetting
(See Fig. 4-6)

1) Adjust the height from the mechanism chassis upper to the TG-2 upper flange ① upper surface to 18.6 mm by rotating the TG-2 upper flange ①.

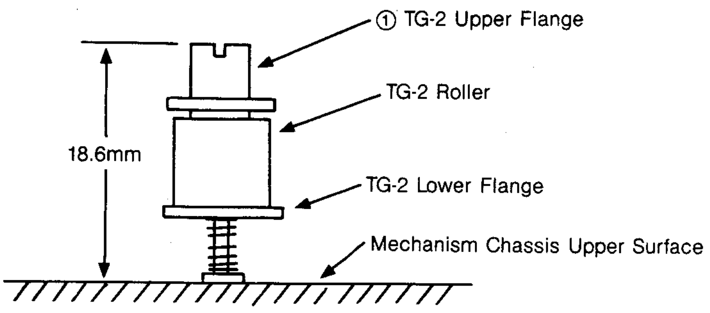

① TG-2 Upper Flange
TG-2 Roller
18.6mm
TG-2 Lower Flange
Mechanism Chassis Upper Surface

Fig. 4-6

(Reference)
This A-mechanism is equipped with four adjustable guides (TG-2, 3, 6 and 7). To raise or lower the respective guide rotate the corresponding adjustment screw as shown below.

Guide	Guide adjustment	Rotating direction of adjustment screw
TG-2, 3, 6	Raise	Counterclockwise
	Lower	Clockwise
TG-7	Raise	Clockwise
	Lower	Counterclockwise

4-5-2) No.2 Guide (TG-2) Adjustment
(See Figs. 4-7. and 4-8.)

1) Playback a thin tape like the P6-120MP, etc. and set the REV mode.
2) Confirm that the tape is not bent at the lower flange ② of the No.2 guide (TG-2) ① (See Fig. 4-7). If it is, turn the upper flange ③ of the No.2 guide (TG-2) ① clockwise with a screwdriver, lowering it until the tape is straightened.
3) Playback the alignment tape for tracking adjustment.
4) Perform tracking adjustment and tracking fine adjustment as described in sections 4-3. and 4-4.
5) In the track shift mode, CUE/REV the tape, then play it back and confirm that the RF waveform rises flat within 2 seconds.
6) If the waveform is not normal (See Fig. 4-8), turn the upper flange ③ of the No.2 guide (TG-2) ① 90° counter-clockwise and repeat step 5.
   Repeat steps 5 and 6 until a normal waveform is obtained. Then, confirm that the tracking waveform has not changed. If it has, perform fine adjustment of entrance side tracking and repeat step. 5.

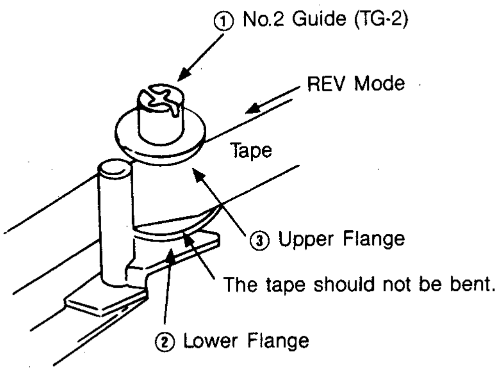

① No.2 Guide (TG-2)
REV Mode
Tape
③ Upper Flange
The tape should not be bent.
② Lower Flange

Fig. 4-7

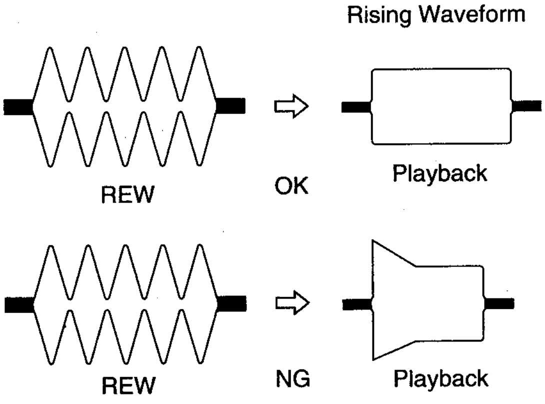

Rising Waveform
REW
OK
Playback
REW
NG
Playback

Fig. 4-8

4-6) No.7 GUIDE (TG-7) ADJUSTMENT
(See Fig. 4-10.)

1) Playback the alignemtn tape for tracking adjustment and set the REV mode.
2) Confirm that the tape is not bent between the No.6 guide (GT-6) ① and the capstan ②. If it is, turn the height adjusting screw ④ of the No.7 guide (TG-7) ③ until the tape is straightened.
3) Set the playback mode again and confirm that the tape is not bent between the capstan ② and the No.7 guide (specification: 0.5 mm or less). If the tape is bent beyond the specification, turn the height adjusting screw ④ of the No.7 guide (TG-7) ③ until bending is within the specification (0.5 mm).
   If in the REV mode tape bending between the No.6 guide (TG-6) ① and the capstan ② is 0.3 mm or less, adjustment can be considered completed.

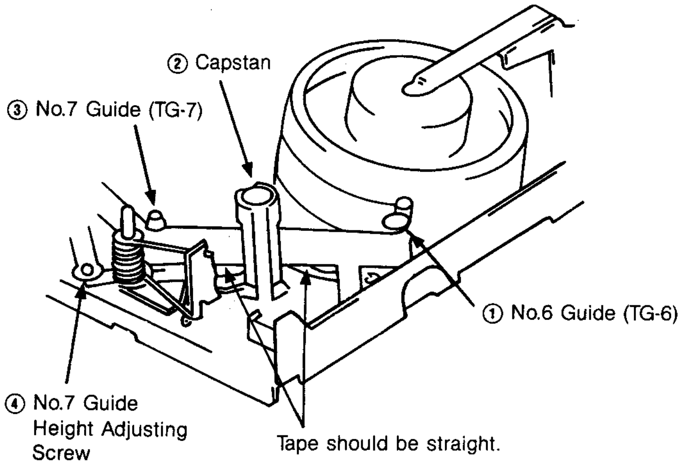


Fig. 4-9

4-7) CUE AND REV WAVEFORM CHECK
(See Fig. 4-10.)

1) Playback the alignment tape for tracking adjustment and set the REV mode. Confirm that waveform peaks maintain a constant pitch of 5 seconds or more (See Fig. 4-10). In case pitch is not constant, perform section 4-4. Tracking Fine Adjustment and section 4-6. No.7 Guide Adjustment.
2) Set the CUE MODE. Confirm that waveform peaks still maintain a constant pitch of 5 seconds or more (see Fig. 4-10). Otherwise, perform section 4-4. Tracking Fine Adjustment.

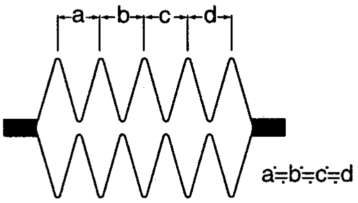
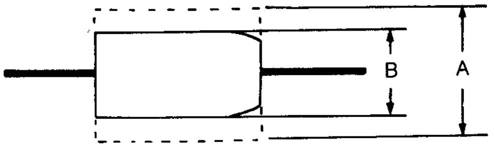


Fig. 4-10

4-8) CHECK AFTER ADJUSTMENT

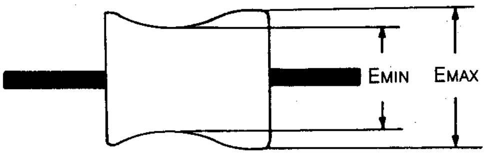
4-8-1) Tracking Check

1) Confirm that the amplitude of RF waveform is reduced to approx. 2/3 to 3/4 when the track shift mode is set (See Fig. 4-11).
2) Then, confirm that the minimum amplitude value (EMIN) is 65% of the maximum value (EMAX) or larger (See Fig. 4-12).
3) Confirm that no large fluctuations occur on the waveform (See Fig. 4-13).



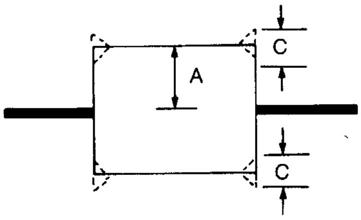
B=2/3A~3/4A

Fig. 4-11



$\frac{E_{MIN}}{E_{MAX}} \geqq 65\ (\%)$

Fig. 4-12



C ≦ 1/4 A

Fig. 4-13

4-8-2) Rising Check (See Fig. 4-14.)

1) Playback the alignment tape for tracking adjustment.
2) Cancel the track shift mode.
3) Eject the tape, then load it again.
4) Set the playback mode and confirm that the RF waveform rises flat within 2 seconds. Also confirm that the tape is not bent around the pinch roller (See Fig. 4-14).
5) CUE/REV and FF/REW the tape, then play it back and confirm that the RF waveform rises flat within 2 seconds. Also confirm that the tape is not bent around the pinch roller.
6) Repeat steps 3) to 5) once more.

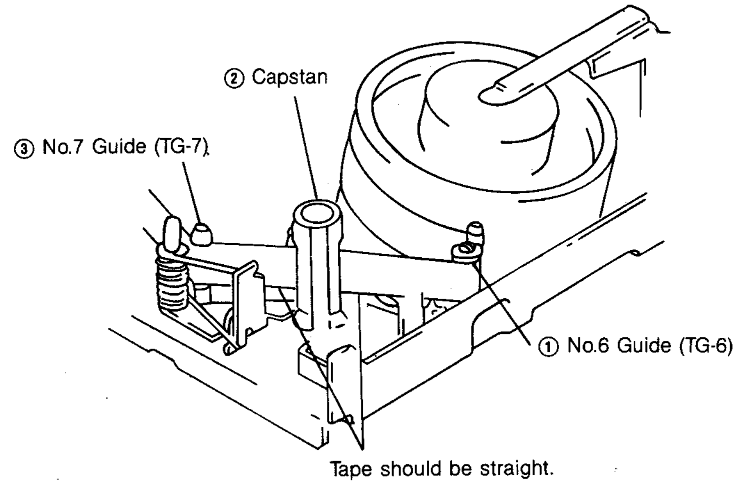

② Capstan
③ No.7 Guide (TG-7)
① No.6 Guide (TG-6)
Tape should be straight.

Fig. 4-14

4-8-3) Tape Path Check (See Fig. 4-15.)

1) Playback a thin tape like the P6-120MP (NTSC) or P5-90MP (PAL), etc. and confirm that no tape rising occurs, and that curling is less than 0.3 mm, at the lower flange of the No.2 guide, the upper flange of the No.3 guide, the upper flange of the No.6 guide and the No.7 guide upper and lower flanges.
2) Confirm that no tape rising occurs and that curling is less than 0.3 mm at the flanges of all guide when pressing the FF button in the playback mode to set the CUE mode, or the REW button to set the REV mode.

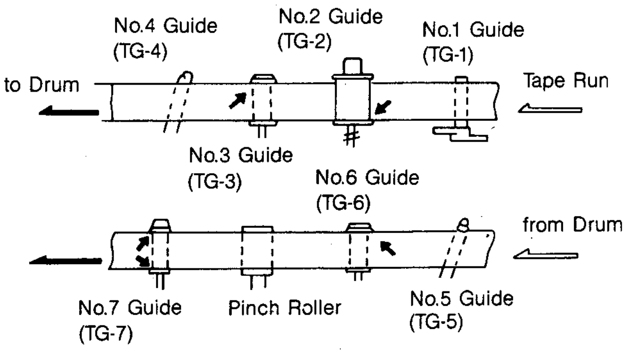
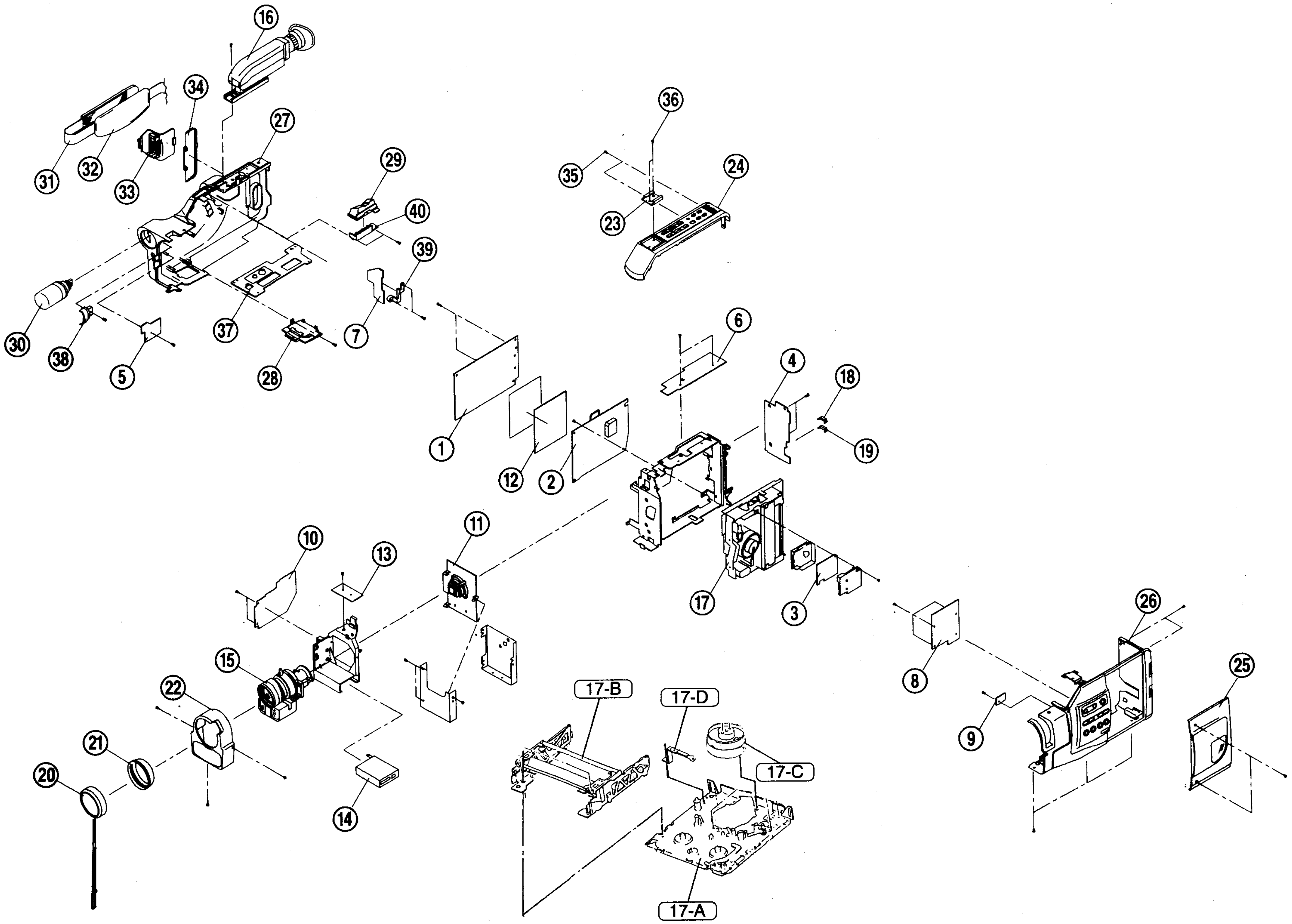

No.4 Guide (TG-4)
No.2 Guide (TG-2)
No.1 Guide (TG-1)
to Drum
Tape Run
No.3 Guide (TG-3)
No.6 Guide (TG-6)
from Drum
No.7 Guide (TG-7)
Pinch Roller
No.5 Guide (TG-5)

Fig. 4-15

5. EXPLODED VIEW AND SPARE PART LIST

5-1. Exploded View



NO	PART NAME	S/N	REMARK
1	VA-10 AS PCB	97PB162500	
2	SS-10 AS PCB	97PB162600	
3	HA-10 AS PCB	97PB140200	
4	MC-10 AS PCB	97PB162800	
5	MA-10 AS PCB	97PB140400	
6	VK-10 AS PCB	97PB163000	
7	RS-10 AS PCB	97PB140600	
8	CK-10 AS PCB	97PB140700	
9	LD 10 AS PCB	97PB175900	
10	CAP-10 AS PCB	97PB163200	
11	CAD-10 AS PCB	97PB163300	
12	TWB-10 AS PCB	97PB163400	
13	CS-10 AS PCB	97PB163500	
14	DD-10 AS PCB	97PB141500	
15	CAMERA LENS AS	97PB141200	
16	EVF TOTAL AS	97PB0010E-	
17	DECK PRICE AS	97PB178500	
17-A	DECK SUB AS	97SA274900	
17-B	CASSETTE HOUSING AS	97SA258000	
17-C	DRUM AS	97SB386300	
17-D	EARTH PLATE AS	97SB372700	
18	FUSE (1.25A 125V)	5F1CJ1221M	
19	FUSE (1.6A 125V)	5F1CJ1621M	
20	CAP HOOD	97P0446200	
21	CASE HOOD	97P0447900	
22	IR CAP AS	97PA274600	
23	BRKT SHOE	97P2435000	
24	CABINET TOP AS	97PB153401	
25	CASSETT DOOR AS	97PA274701	
26	LEFT CABINET AS	97PB153300	
27	RIGHT CABINET SUB AS II	97RA210800	
28	LITHIUM BATTERY AS	97PA274300	
29	ZOOM AS	97PA274200	
30	MIC AS	97PA273900	
31	BELT GRIP AS	97PA2740GD	
32	GRIP AS	97PB386400	
33	R/S KNOB AS	97PA274100	
34	DOOR A/V JACK	97P18113GD	
35	SCREW SPECIAL	97P3118200	
36	SCREW MACHINE	7005200412	
37	BRKT STAND AS	97PA277400	
38	CABINET MIC FIXED	97P0102200	
39	GUIDE RS PCB	97P2507000	
40	PLATE Z/K GUIDE	97P0939500	

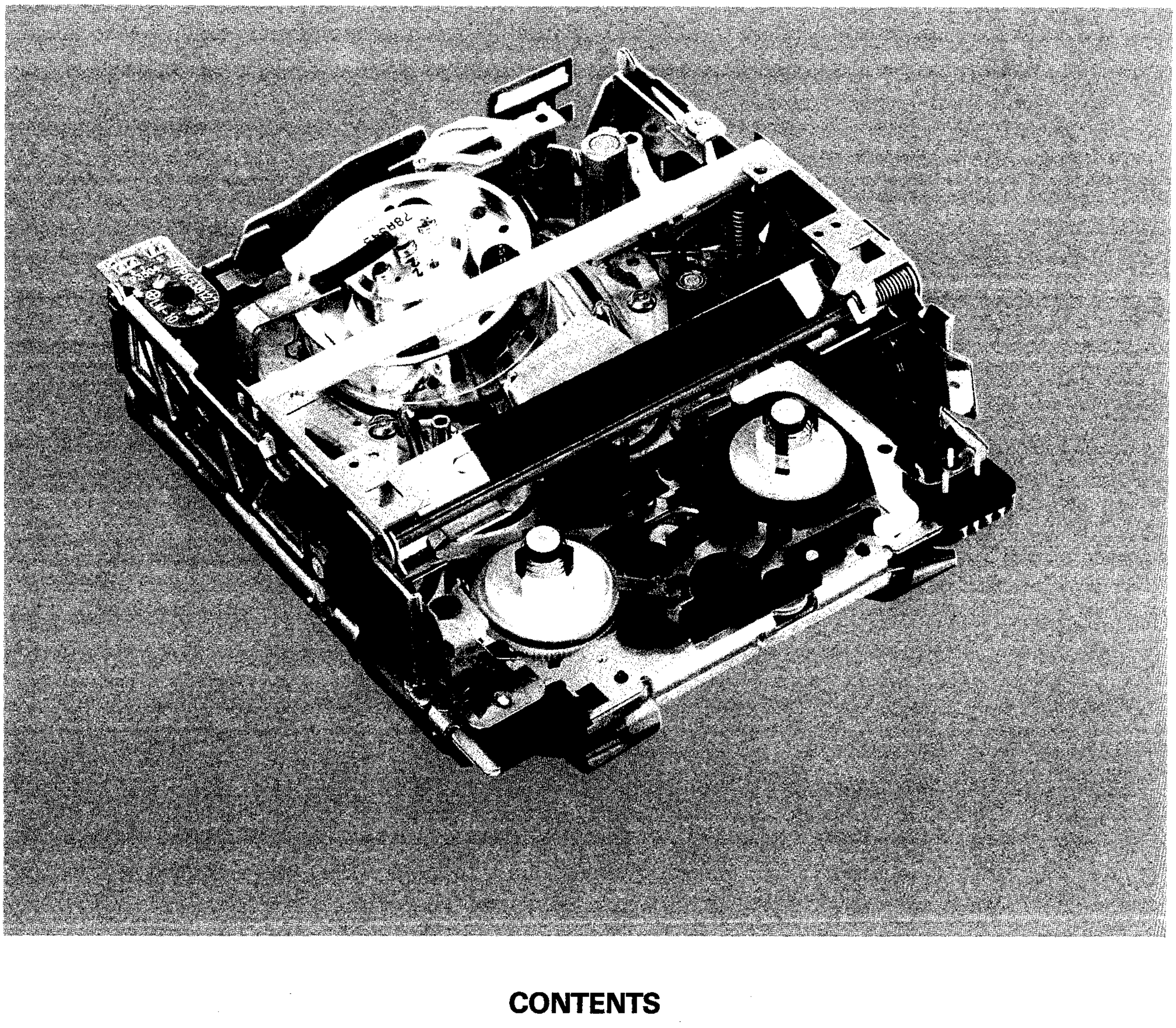
VIDEO 81

Bestell-Nummer 065,280 0

MECHANISM SERVICE MANUAL

8mm CAMCORDER

A-MECHA



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Quelle

PART I
8mm A-MECHANISM OPERATIONAL MANUAL

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SECTION 1
MAJOR PARTS EXPLANATION AND LOCATION

1-1. 8mm Video Cassette Automatic Discrimination Mechanism

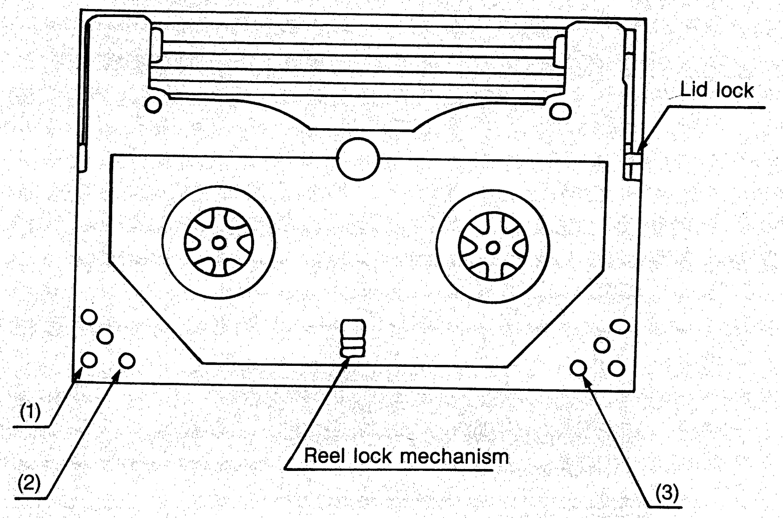

Lid lock
(1)
(2)
Reel lock mechanism
(3)

Table .1

	Purpose	Close	Open
(1)	Erasure-proof switch hole	REC enable	REC disable
(2)	Tape type	Type A (MP Tape)	Type B (ME Tape)
(3)	Tape thickness	13 μm Tape (P6-90)	10 μm Tape

Fig 1 Bottom Side View of Cassette Tape

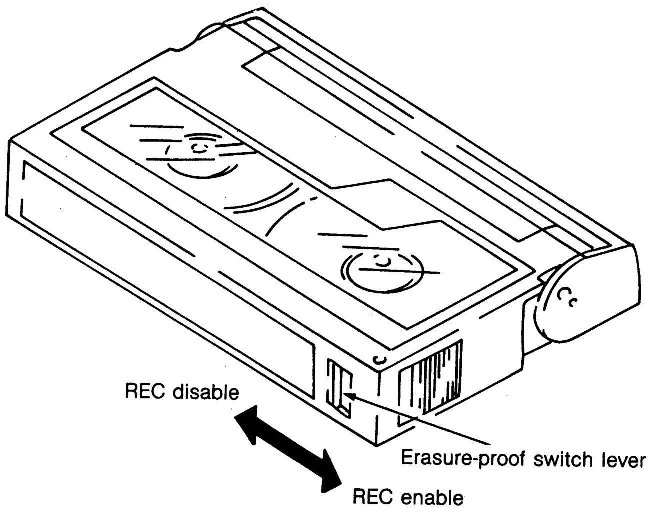

REC disable
Erasure-proof switch lever
REC enable

Fig. 2

1-2 Location and Name of Major Parts

—Top View—

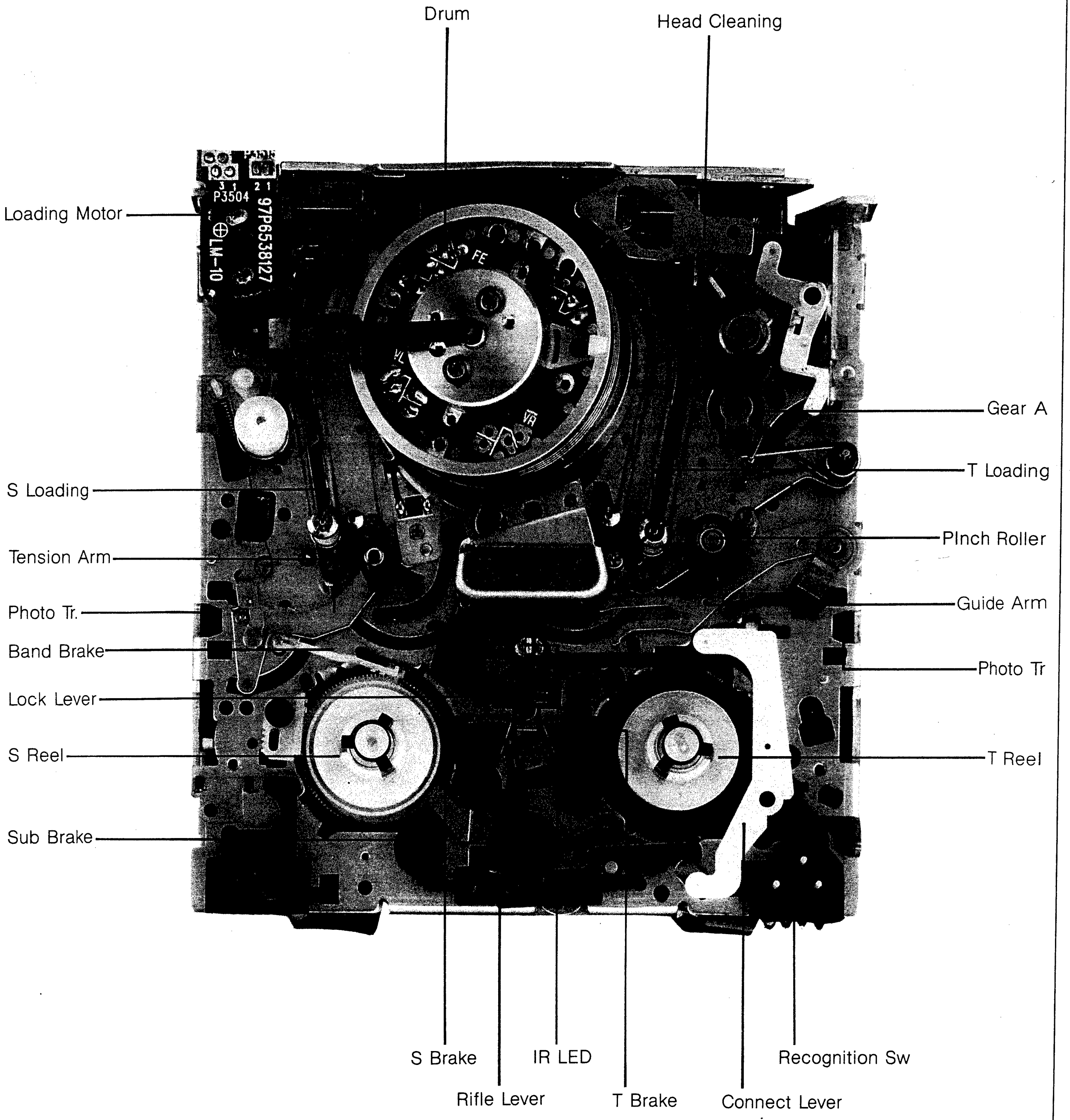

Drum
Head Cleaning
Loading Motor
P3504
97P6538127
LM-10
Gear A
T Loading
S Loading
Pinch Roller
Tension Arm
Guide Arm
Photo Tr.
Band Brake
Photo Tr
Lock Lever
S Reel
T Reel
Sub Brake
S Brake
IR LED
Recognition Sw
Rifle Lever
T Brake
Connect Lever

Fig. 3 (1/2) Location and Name of Major Parts

1-2 Location and Name of Major Parts

—Top View—

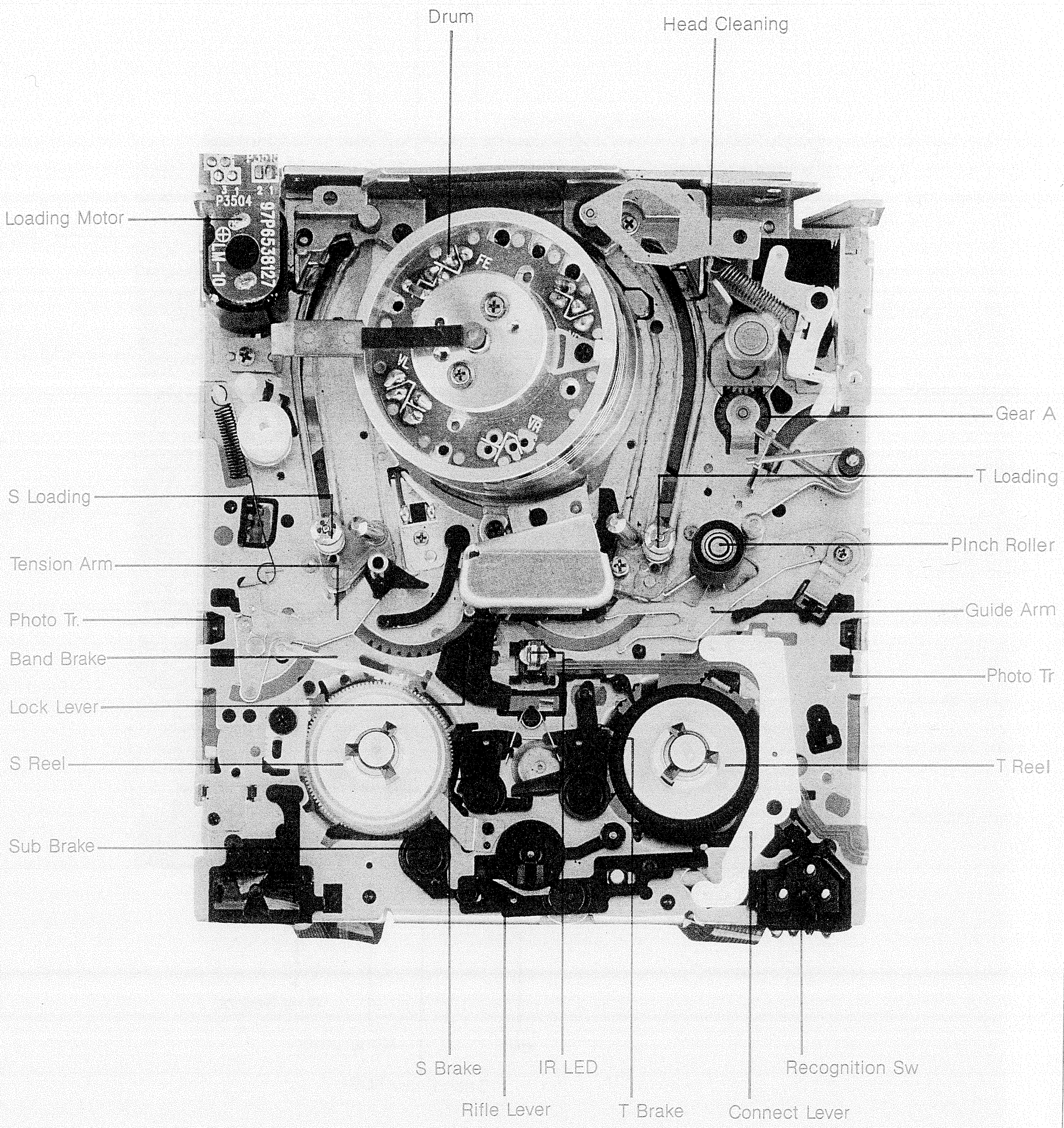

Drum
Head Cleaning
Loading Motor
Gear A
T Loading
S Loading
Pinch Roller
Tension Arm
Guide Arm
Photo Tr.
Photo Tr
Band Brake
Lock Lever
S Reel
T Reel
Sub Brake
S Brake
IR LED
Recognition Sw
Rifle Lever
T Brake
Connect Lever

Fig. 3 (1/2) Location and Name of Major Parts

—Bottom View—

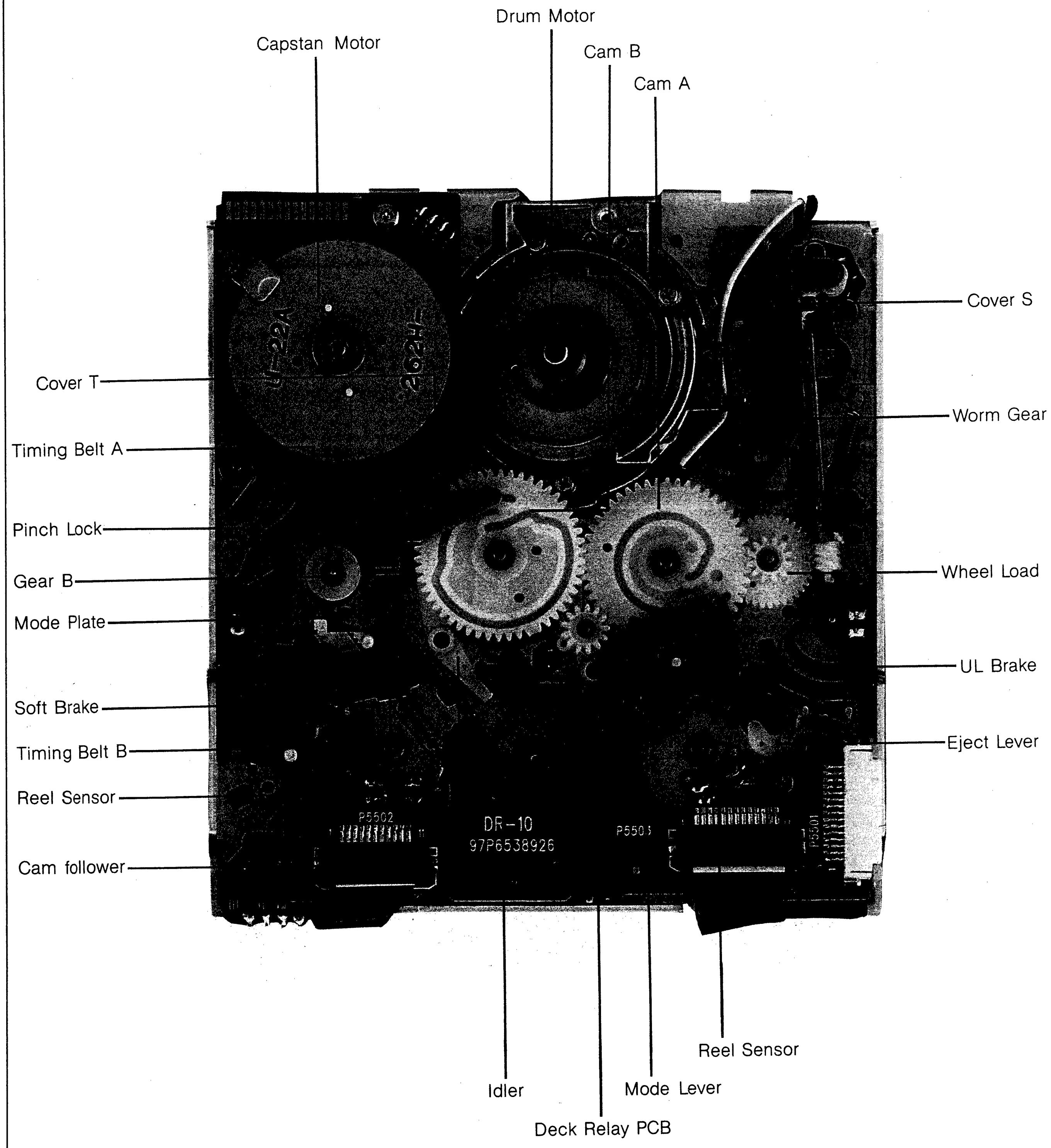

Capstan Motor
Drum Motor
Cam B
Cam A
Cover S
Cover T
Worm Gear
Timing Belt A
Pinch Lock
Gear B
Wheel Load
Mode Plate
UL Brake
Soft Brake
Eject Lever
Timing Belt B
Reel Sensor
Cam follower
P5502
DR-10
97P6538926
P5503
P5501
Reel Sensor
Idler
Mode Lever
Deck Relay PCB

Fig. 3 (2/2) Location and Name of Major Parts

—Bottom View—

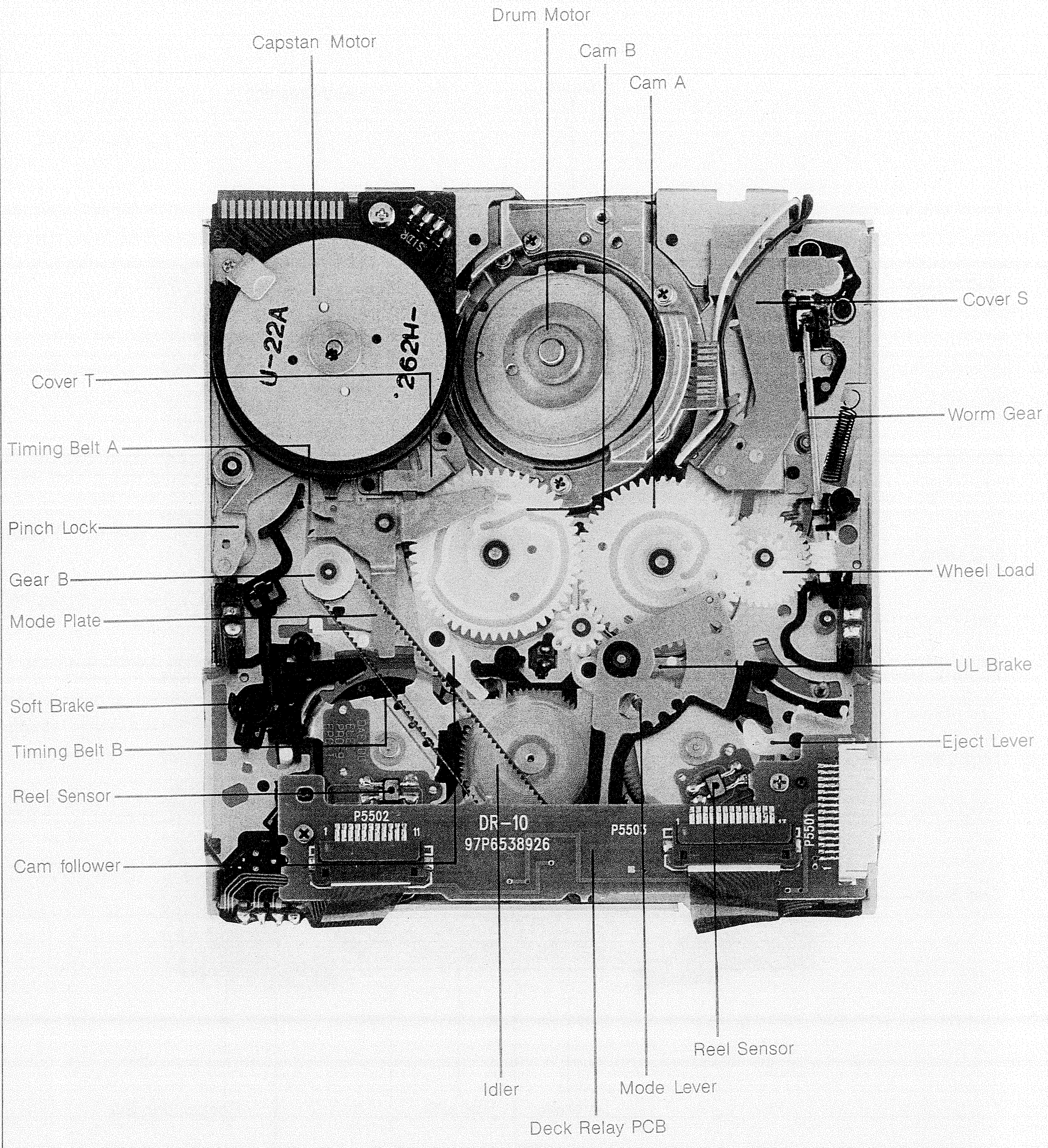

Drum Motor
Capstan Motor
Cam B
Cam A
Cover S
Cover T
Worm Gear
Timing Belt A
Pinch Lock
Gear B
Wheel Load
Mode Plate
UL Brake
Soft Brake
Eject Lever
Timing Belt B
Reel Sensor
Cam follower
U-22A
262H-
P5502
DR-10
97P6538926
P5503
P5501
Reel Sensor
Idler
Mode Lever
Deck Relay PCB

Fig. 3 (2/2) Location and Name of Major Parts

1-3. Mode switch

Correspondence list of mechanism position and mechanism mode (slide) switch

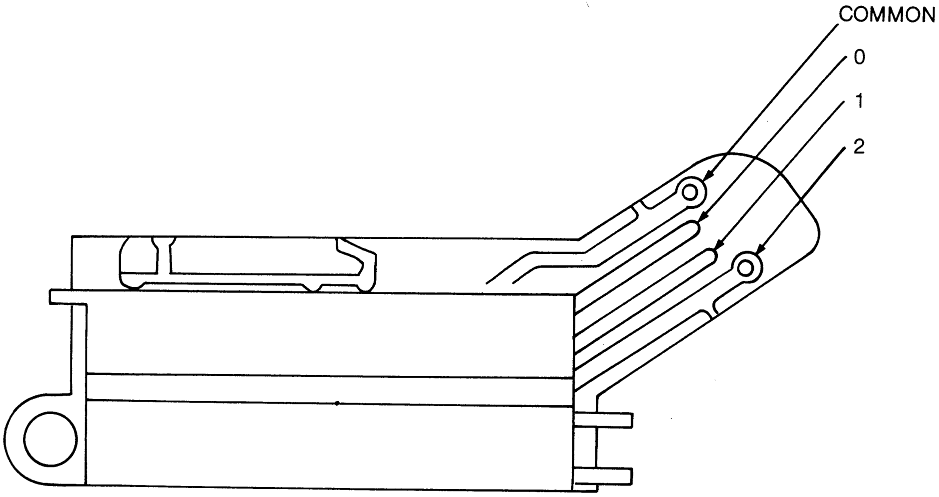


Fig 4. Mode Switch

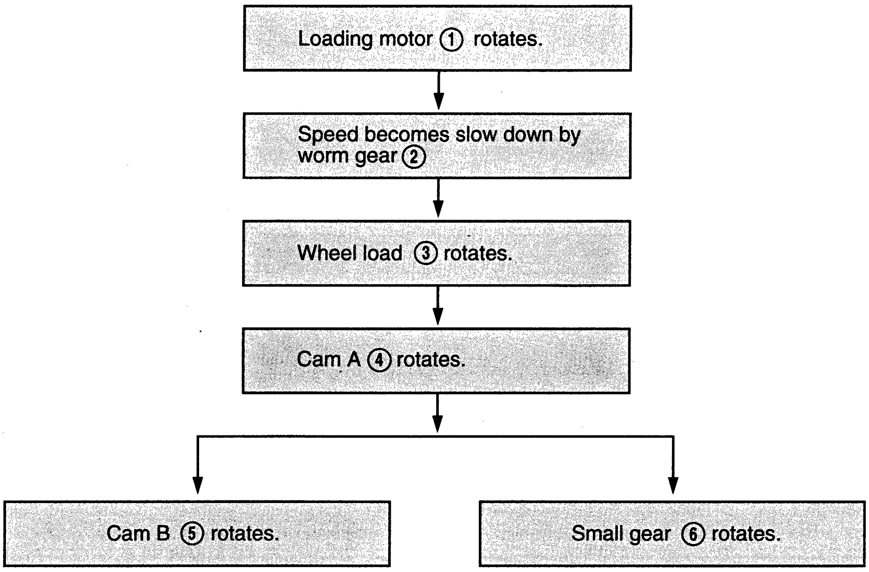
Set continuity with COMMON to 0.

Mode / Pattern	ID	FWD	IC	STOP	IB	UNLOAD	IA	EJECT
0	0	0	0	0	1	1	1	1
1	0	1	1	0	0	0	1	1
2	0	0	1	1	1	0	1	0

Table 2

SECTION 2
MECHANISM OPERATION

2-1. Gear Train


Loading motor ① rotates.
Speed becomes slow down by worm gear ②
Wheel load ③ rotates.
Cam A ④ rotates.
Cam B ⑤ rotates.
Small gear ⑥ rotates.

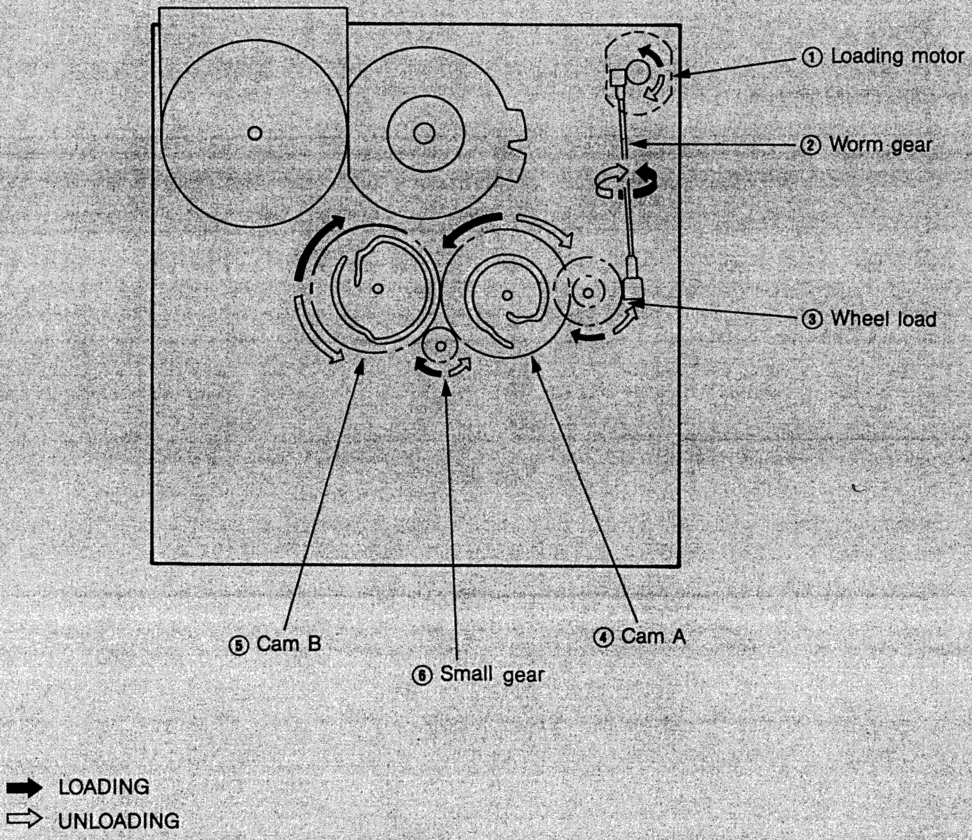
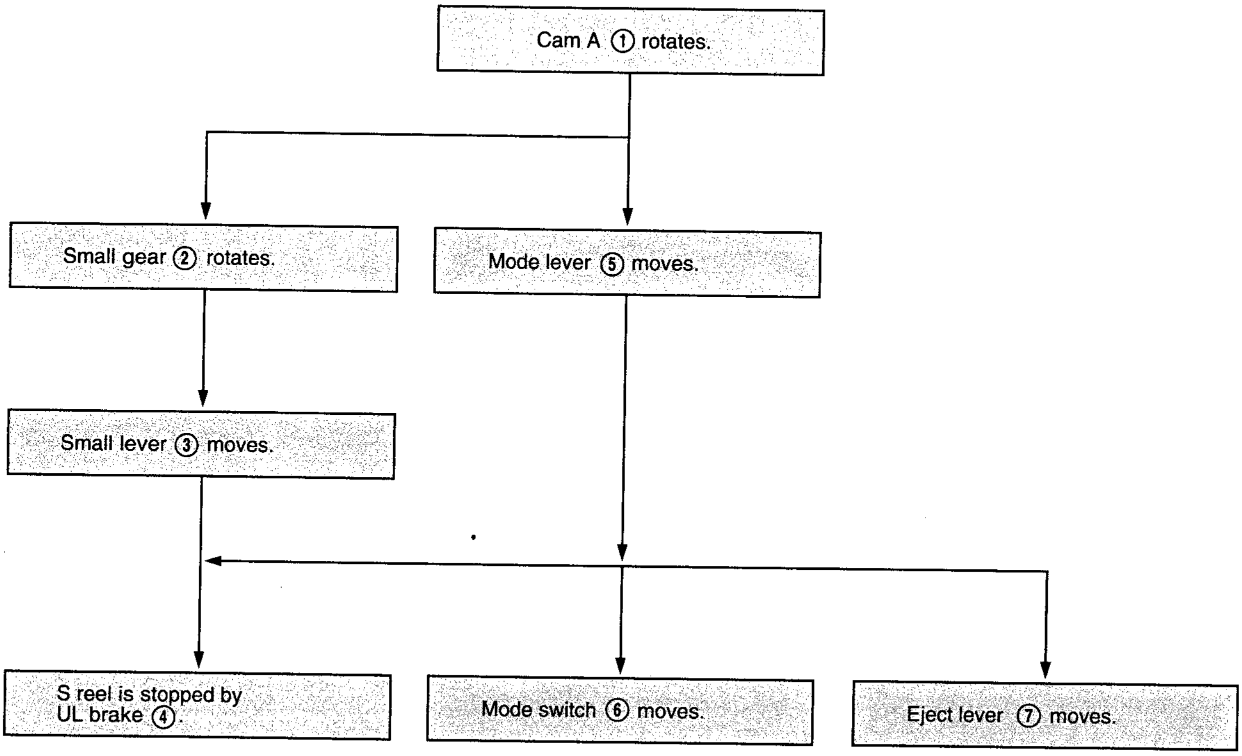

① Loading motor
② Worm gear
③ Wheel load
④ Cam A
⑤ Cam B
⑥ Small gear
LOADING
UNLOADING

Fig. 5. Gear Train

2-2. Mode Switch, Eject Lever, Un-loading Brake


Cam A ① rotates.
Small gear ② rotates.
Mode lever ⑤ moves.
Small lever ③ moves.
S reel is stopped by UL brake ④.
Mode switch ⑥ moves.
Eject lever ⑦ moves.

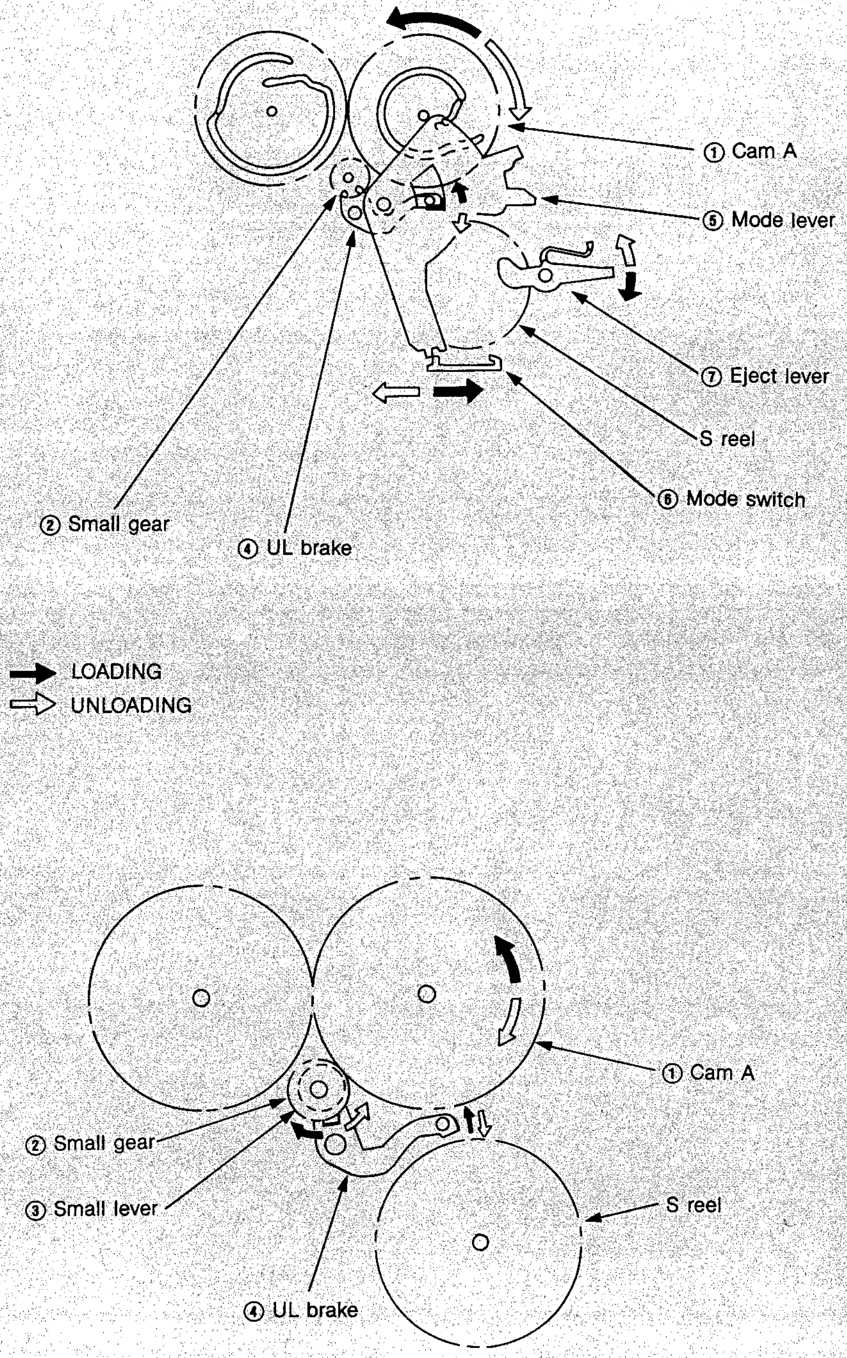
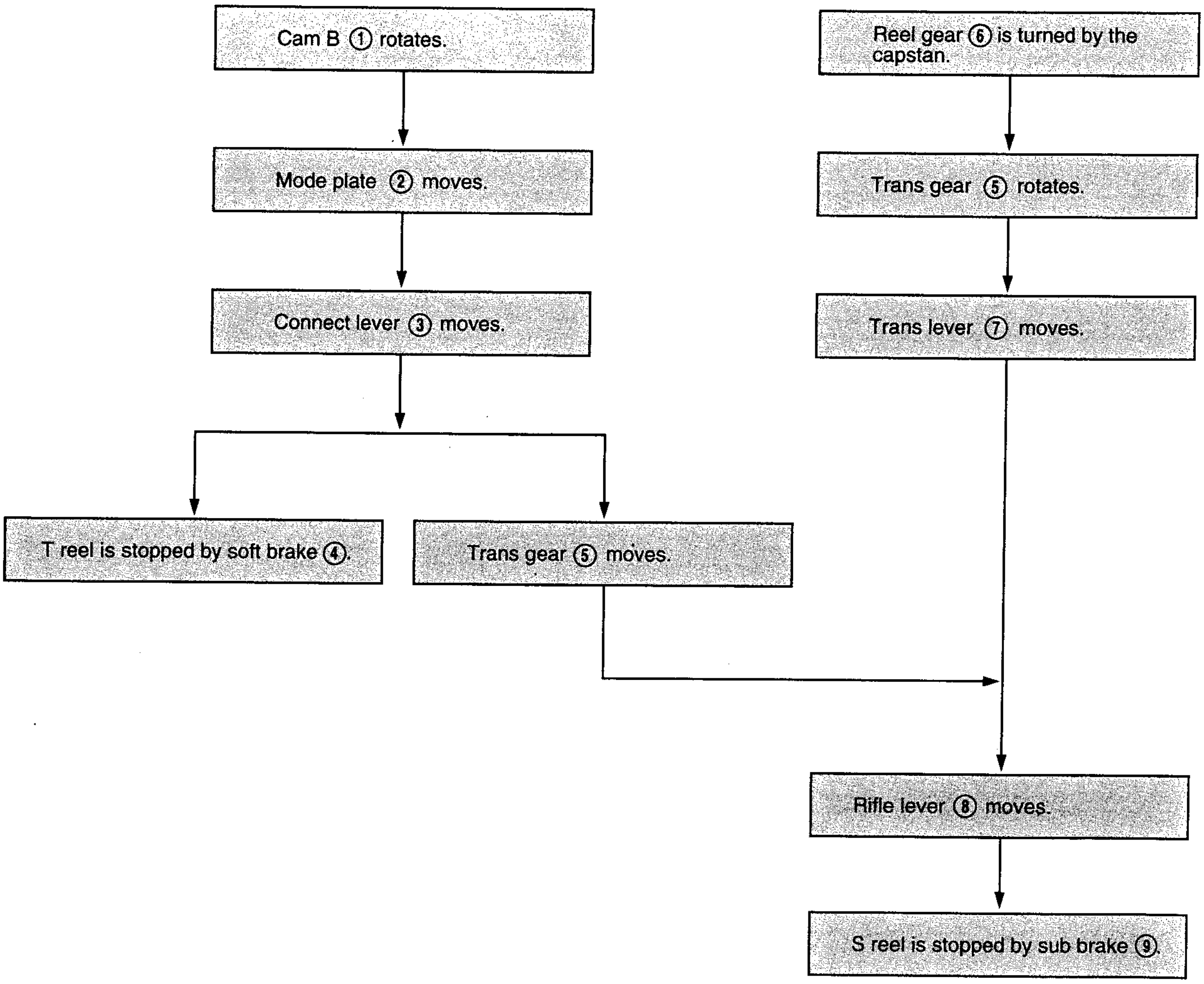

① Cam A
⑤ Mode lever
⑦ Eject lever
S reel
⑥ Mode switch
② Small gear
④ UL brake
➡ LOADING
⇨ UNLOADING
① Cam A
② Small gear
③ Small lever
S reel
④ UL brake

Fig. 6

2-3. Soft Brake, Sub Brake


Cam B ① rotates.
Mode plate ② moves.
Connect lever ③ moves.
T reel is stopped by soft brake ④.
Trans gear ⑤ moves.
Reel gear ⑥ is turned by the capstan.
Trans gear ⑤ rotates.
Trans lever ⑦ moves.
Rifle lever ⑧ moves.
S reel is stopped by sub brake ⑨.

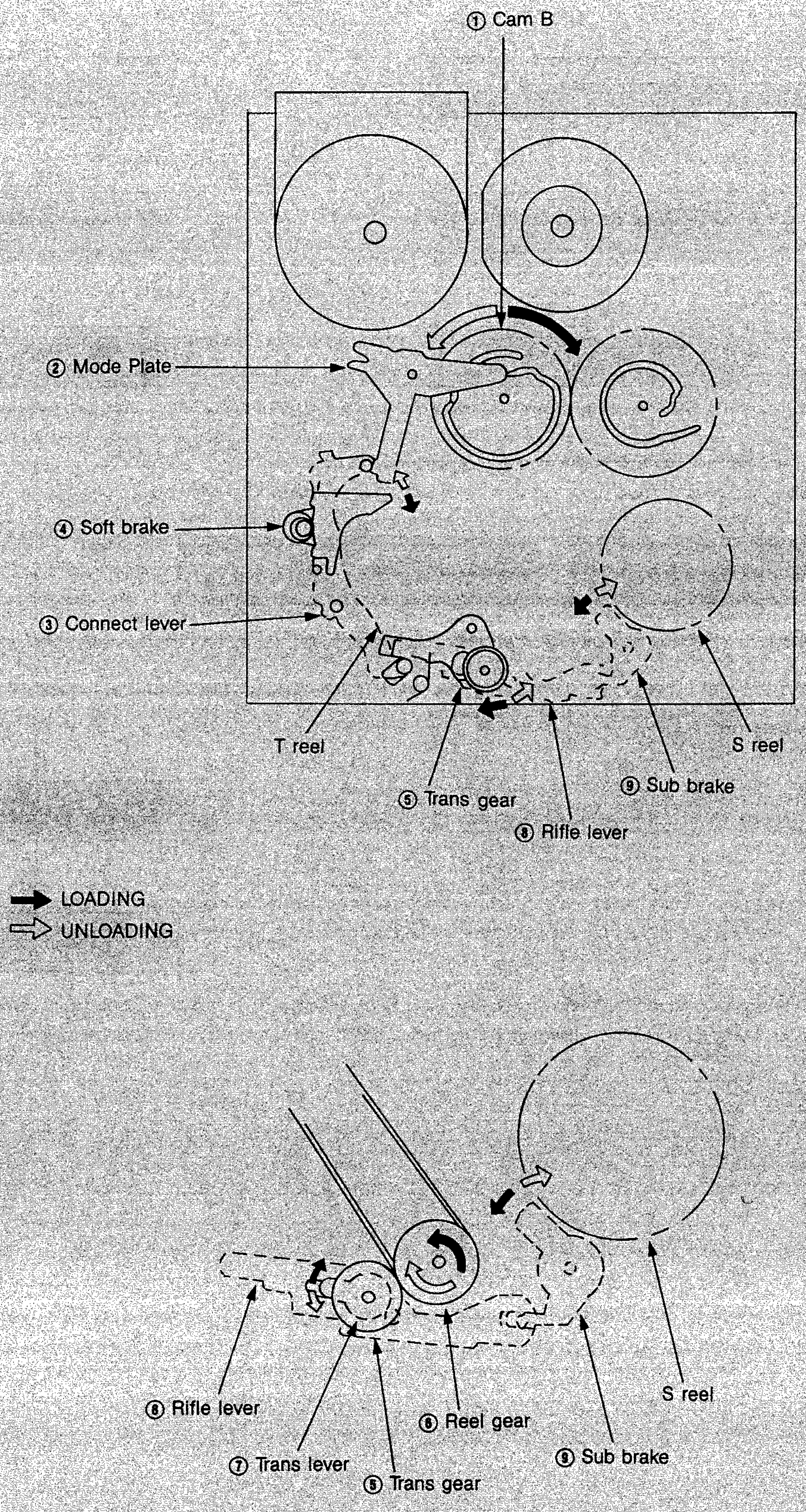
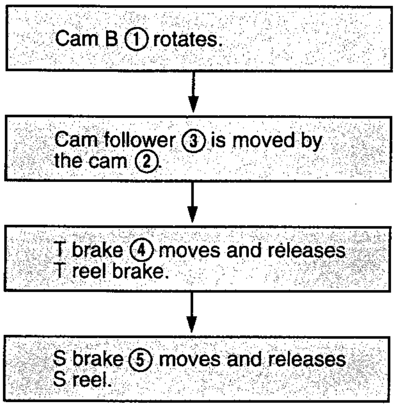

① Cam B
② Mode Plate
④ Soft brake
③ Connect lever
T reel
S reel
⑨ Sub brake
⑤ Trans gear
⑧ Rifle lever
➡ LOADING
⇨ UNLOADING
⑧ Rifle lever
⑥ Reel gear
S reel
⑦ Trans lever
⑤ Trans gear
⑨ Sub brake

Fig. 7

2-4. T Brake, S Brake



Cam B ① rotates.

Cam follower ③ is moved by the cam ②.

T brake ④ moves and releases T reel brake.

S brake ⑤ moves and releases S reel.

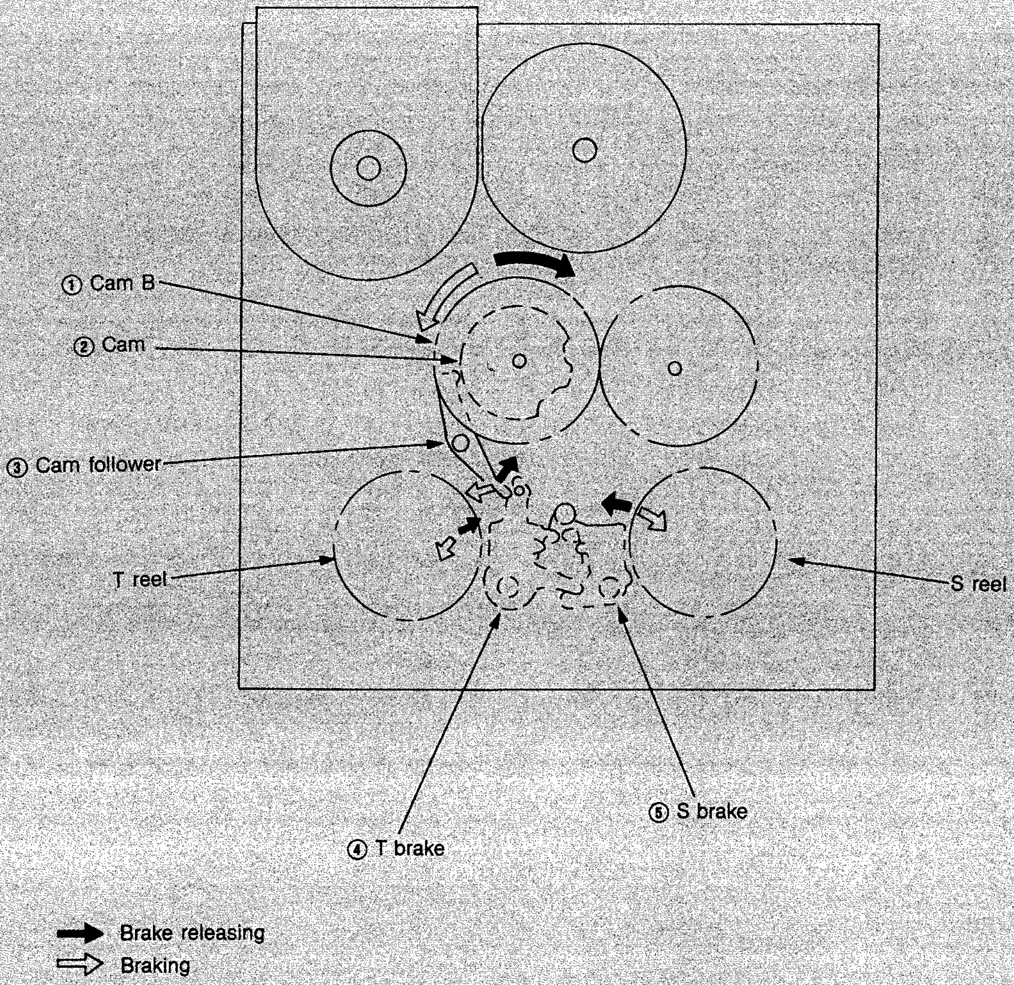
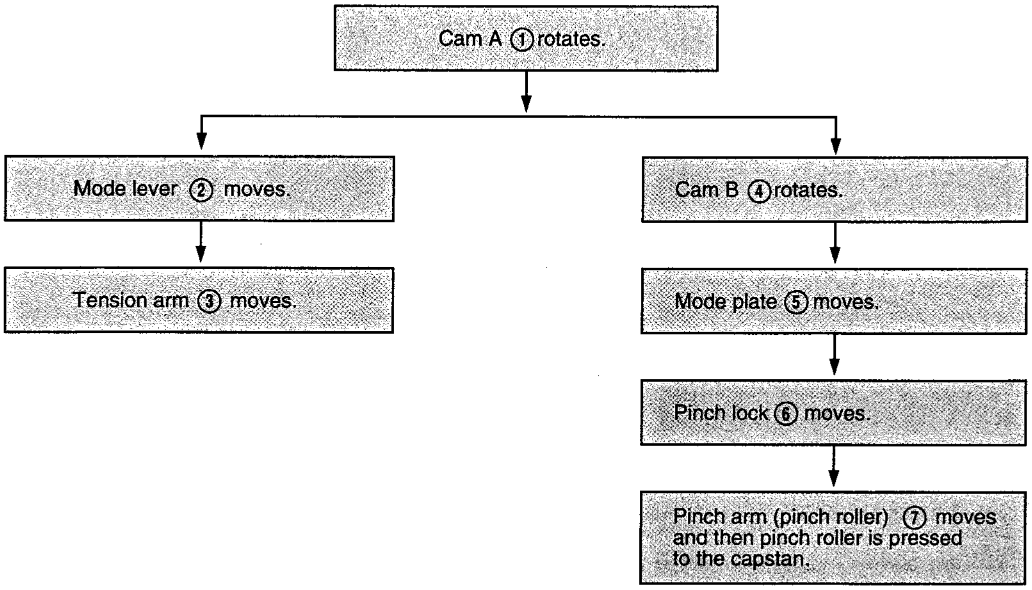

① Cam B
② Cam
③ Cam follower
T reel
S reel
④ T brake
⑤ S brake
Brake releasing
Braking

Fig. 8

2-5. Tension Arm, Pinch Arm (Pinch Roller)


Cam A ① rotates.
Mode lever ② moves.
Tension arm ③ moves.
Cam B ④ rotates.
Mode plate ⑤ moves.
Pinch lock ⑥ moves.
Pinch arm (pinch roller) ⑦ moves and then pinch roller is pressed to the capstan.

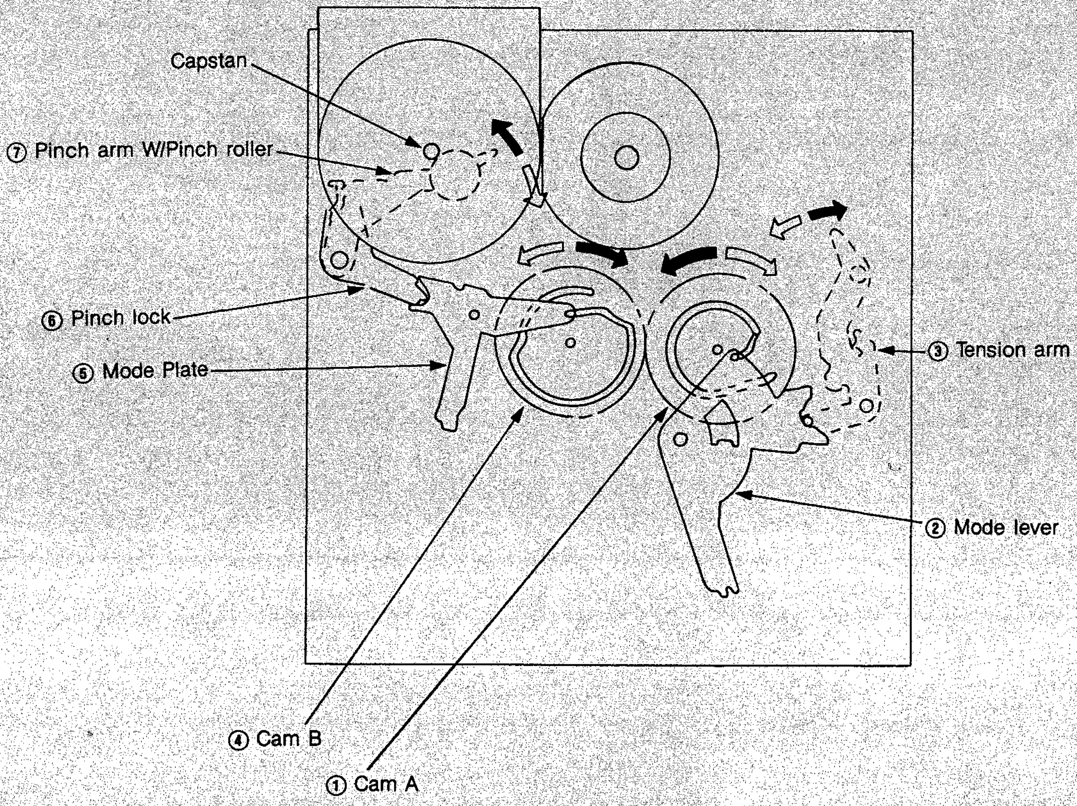
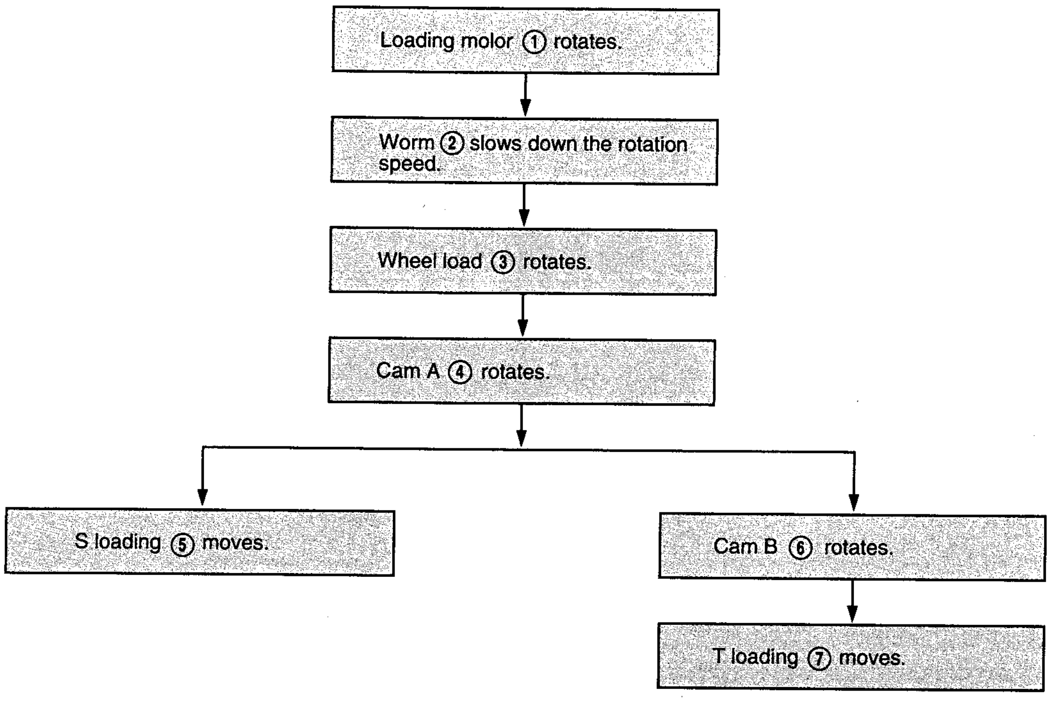

Capstan
⑦ Pinch arm W/Pinch roller
⑥ Pinch lock
⑤ Mode Plate
③ Tension arm
② Mode lever
④ Cam B
① Cam A

Fig. 9

2-6. S Loading, T Loading



Loading molor ① rotates.

Worm ② slows down the rotation speed.

Wheel load ③ rotates.

Cam A ④ rotates.

S loading ⑤ moves.

Cam B ⑥ rotates.

T loading ⑦ moves.

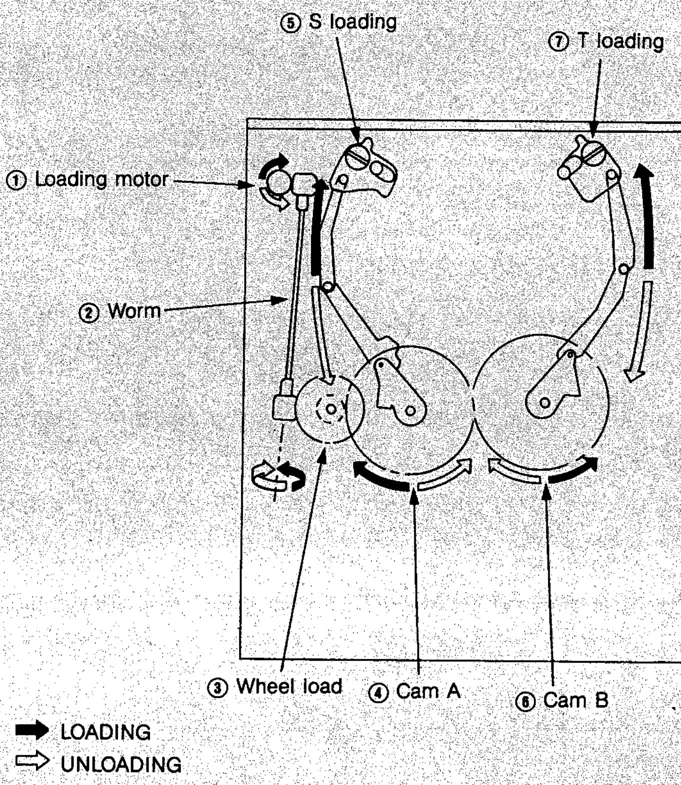
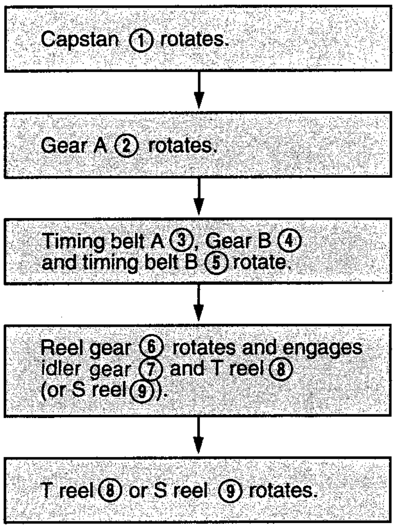

⑤ S loading
⑦ T loading
① Loading motor
② Worm
③ Wheel load
④ Cam A
⑥ Cam B
LOADING
UNLOADING

Fig. 10

2-7. Movement of Reel Table



Capstan ① rotates.

Gear A ② rotates.

Timing belt A ③, Gear B ④ and timing belt B ⑤ rotate.

Reel gear ⑥ rotates and engages idler gear ⑦ and T reel ⑧ (or S reel ⑨).

T reel ⑧ or S reel ⑨ rotates.

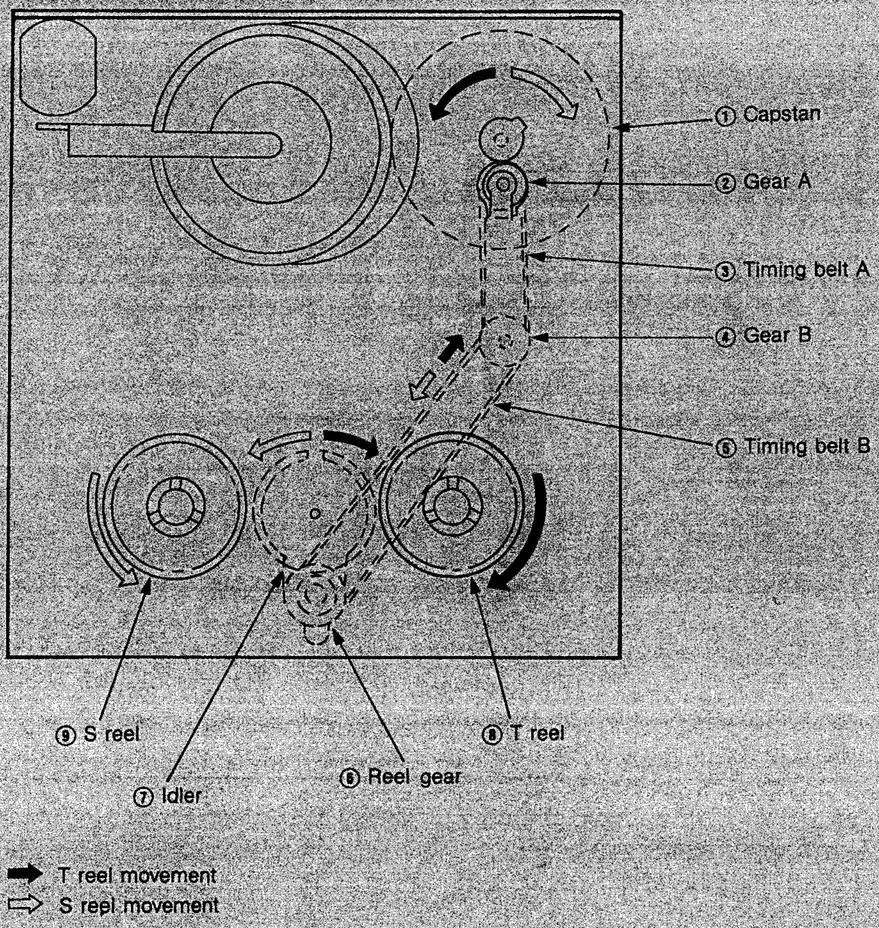
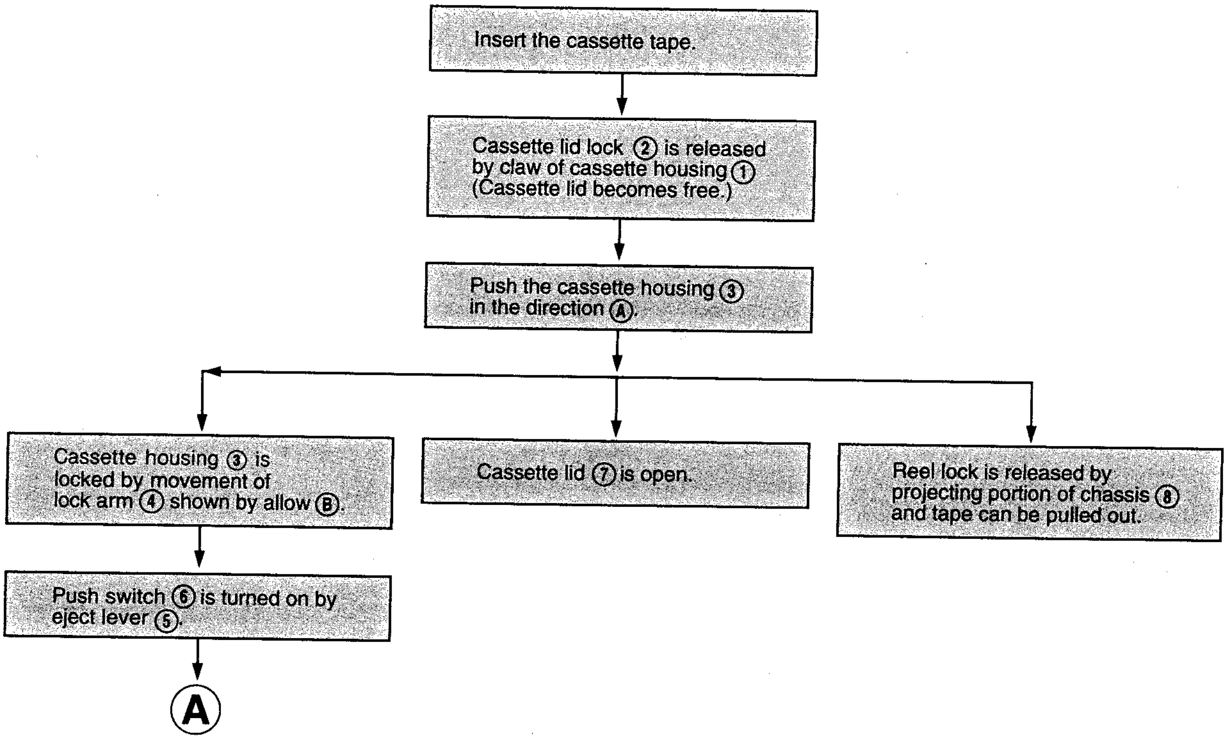

① Capstan
② Gear A
③ Timing belt A
④ Gear B
⑤ Timing belt B
⑨ S reel
⑧ T reel
⑥ Reel gear
⑦ Idler
T reel movement
S reel movement

Fig. 11

SECTION 3
FUNCTION MODE OPERATION

3-1. CASSETTEN IN (1/3)



Insert the cassette tape.

Cassette lid lock ② is released by claw of cassette housing ① (Cassette lid becomes free.)

Push the cassette housing ③ in the direction Ⓐ.

Cassette housing ③ is locked by movement of lock arm ④ shown by allow Ⓑ.

Push switch ⑥ is turned on by eject lever ⑤.

Ⓐ

Cassette lid ⑦ is open.

Reel lock is released by projecting portion of chassis ⑧ and tape can be pulled out.

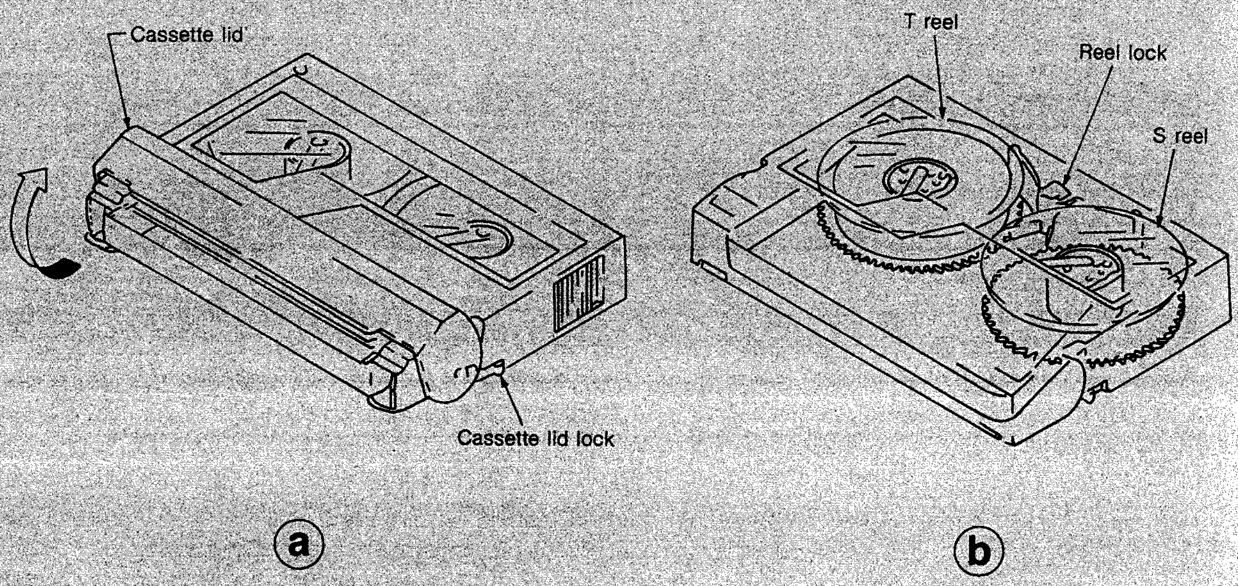

Cassette lid
Cassette lid lock
a
T reel
Reel lock
S reel
b

Fig. 12 (1/2)

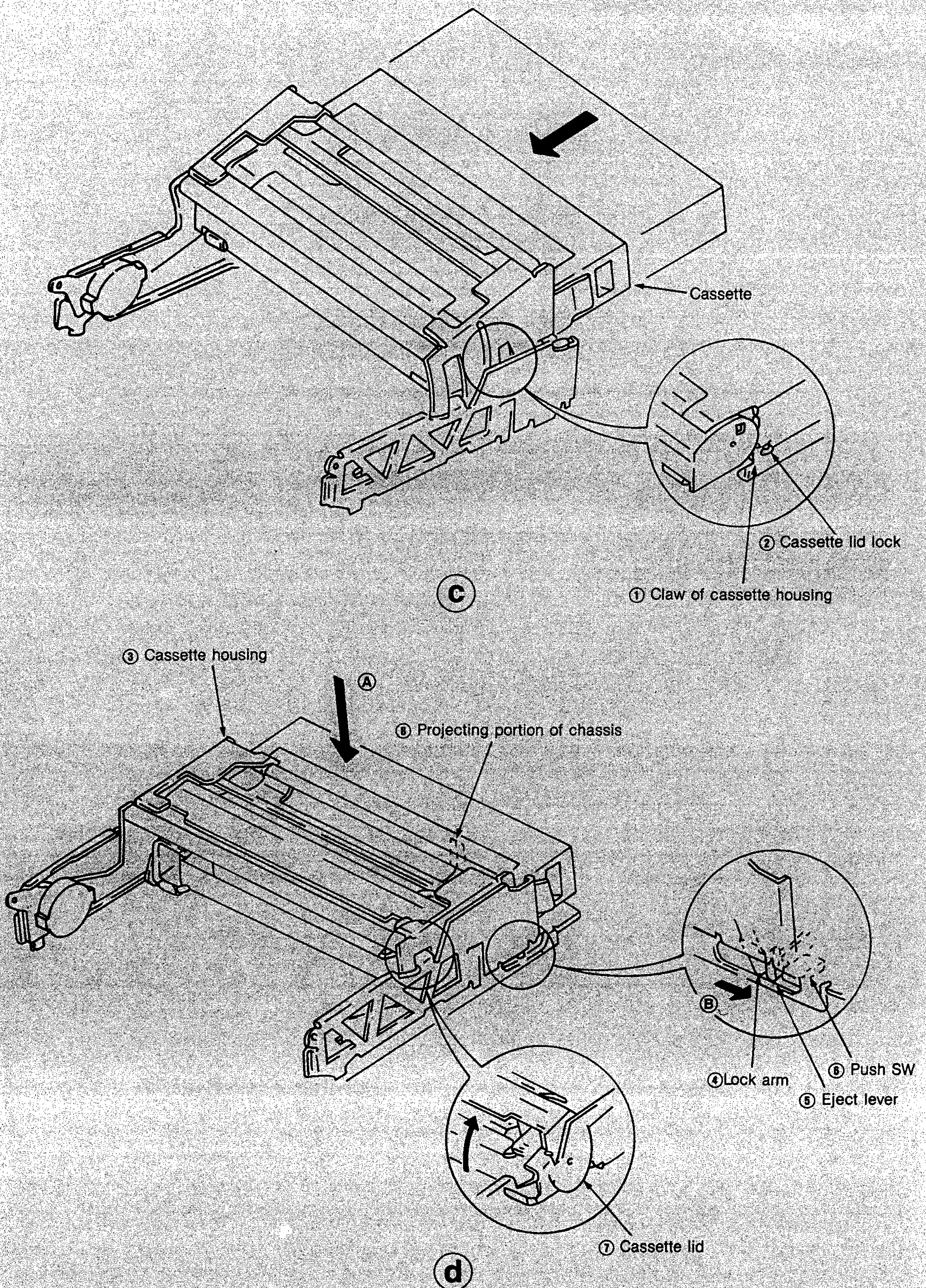
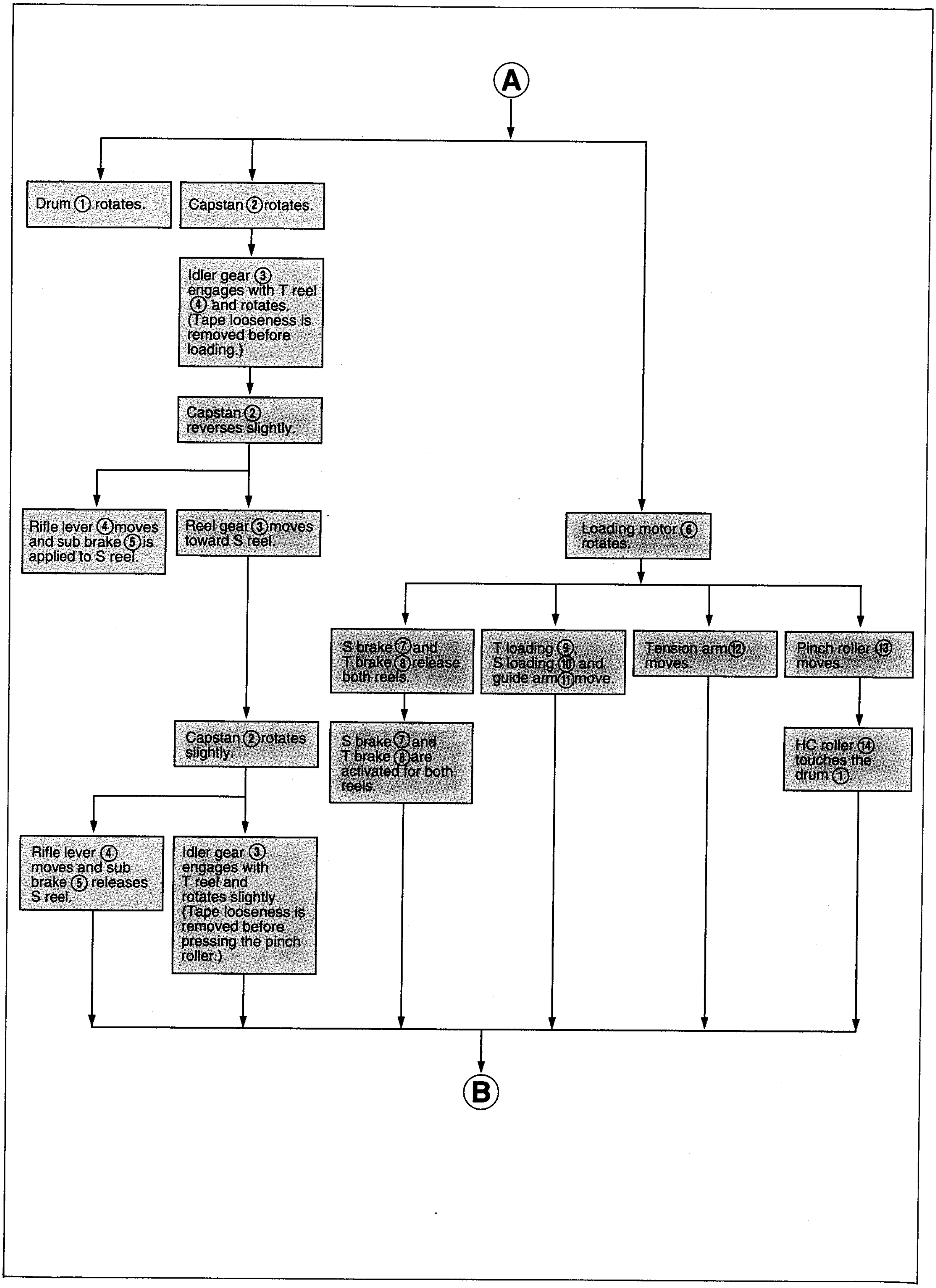

Cassette
② Cassette lid lock
① Claw of cassette housing
c
③ Cassette housing
Ⓐ
⑧ Projecting portion of chassis
Ⓑ
④Lock arm
⑥ Push SW
⑤ Eject lever
⑦ Cassette lid
d

Fig. 12 (2/2)

3-1. CASSETTE IN (2/3)


A
Drum ① rotates.
Capstan ② rotates.
Idler gear ③ engages with T reel ④ and rotates. (Tape looseness is removed before loading.)
Capstan ② reverses slightly.
Rifle lever ④ moves and sub brake ⑤ is applied to S reel.
Reel gear ③ moves toward S reel.
Loading motor ⑥ rotates.
S brake ⑦ and T brake ⑧ release both reels.
T loading ⑨, S loading ⑩ and guide arm ⑪ move.
Tension arm ⑫ moves.
Pinch roller ⑬ moves.
Capstan ② rotates slightly.
S brake ⑦ and T brake ⑧ are activated for both reels.
HC roller ⑭ touches the drum ①.
Rifle lever ④ moves and sub brake ⑤ releases S reel.
Idler gear ③ engages with T reel and rotates slightly. (Tape looseness is removed before pressing the pinch roller.)
B

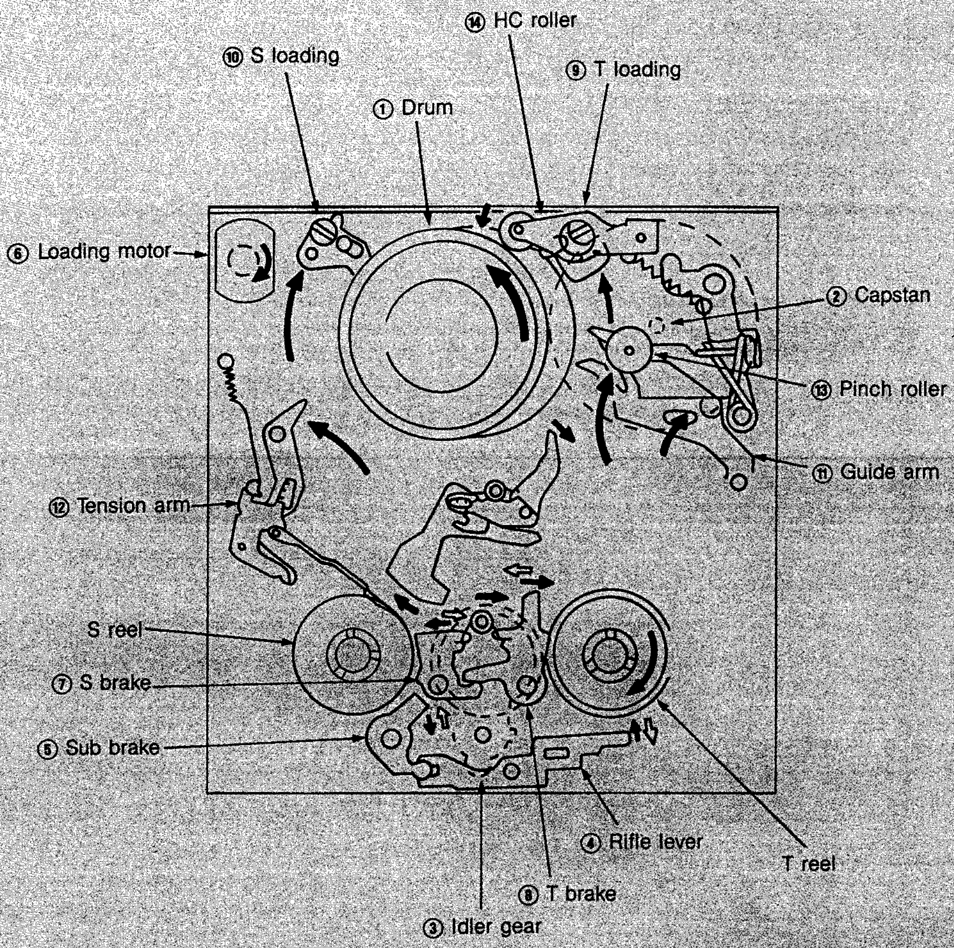
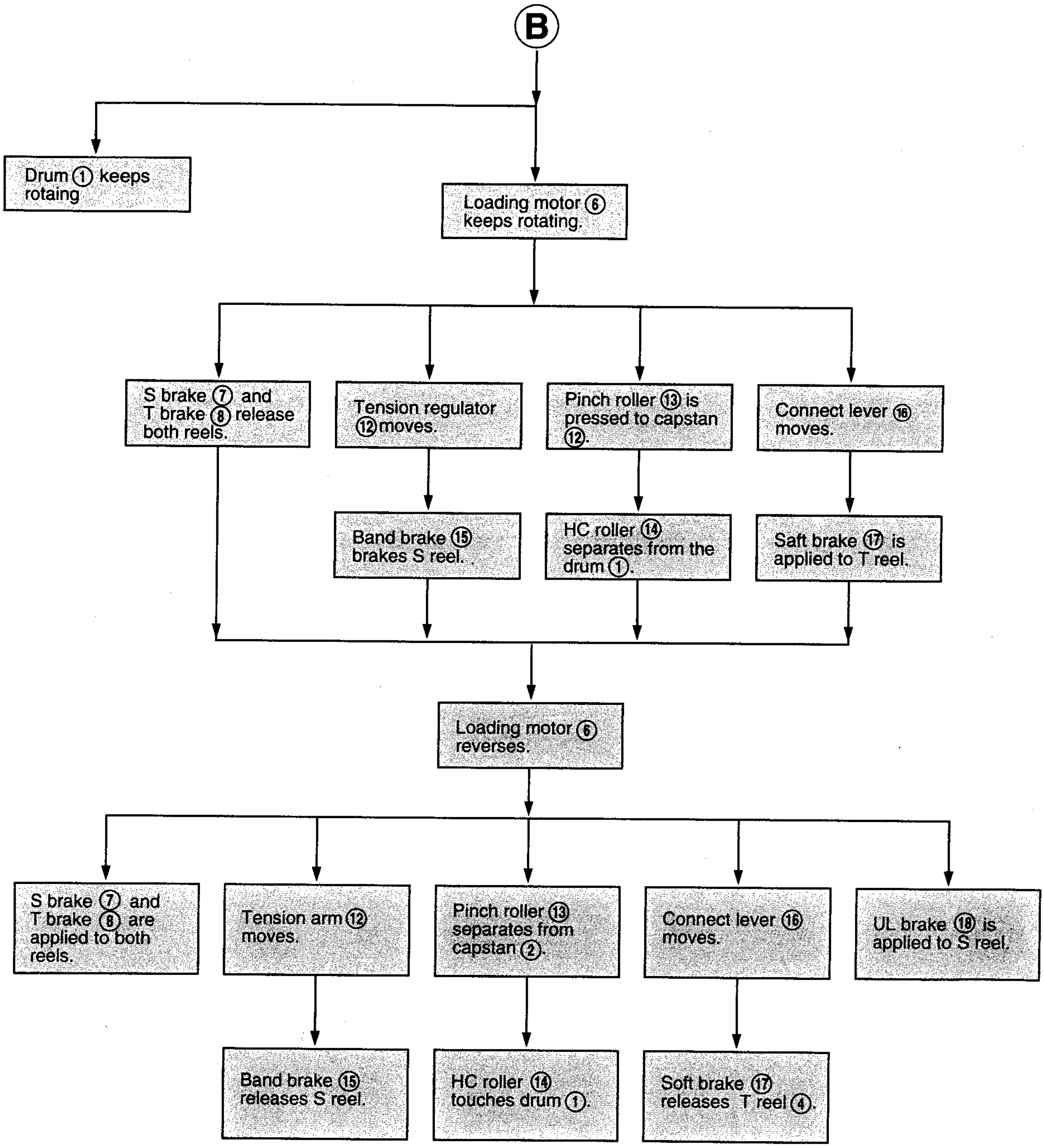

⑭ HC roller
⑩ S loading
⑨ T loading
① Drum
⑥ Loading motor
② Capstan
⑬ Pinch roller
⑪ Guide arm
⑫ Tension arm
S reel
⑦ S brake
⑤ Sub brake
④ Rifle lever
T reel
⑧ T brake
③ Idler gear

Fig. 13

3-1. CASSETTE IN (3/3)


B
Drum ① keeps rotaing
Loading motor ⑥ keeps rotating.
S brake ⑦ and T brake ⑧ release both reels.
Tension regulator ⑫ moves.
Pinch roller ⑬ is pressed to capstan ⑫.
Connect lever ⑯ moves.
Band brake ⑮ brakes S reel.
HC roller ⑭ separates from the drum ①.
Saft brake ⑰ is applied to T reel.
Loading motor ⑥ reverses.
S brake ⑦ and T brake ⑧ are applied to both reels.
Tension arm ⑫ moves.
Pinch roller ⑬ separates from capstan ②.
Connect lever ⑯ moves.
UL brake ⑱ is applied to S reel.
Band brake ⑮ releases S reel.
HC roller ⑭ touches drum ①.
Soft brake ⑰ releases T reel ④.

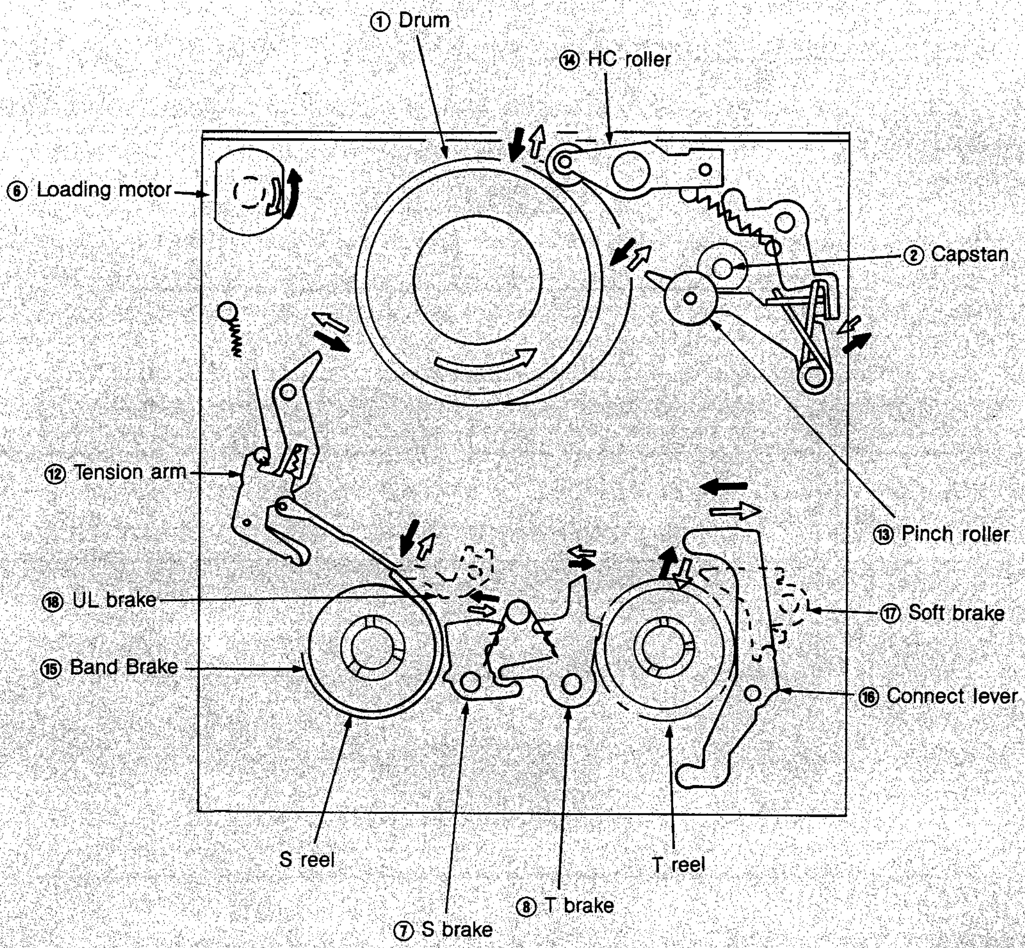
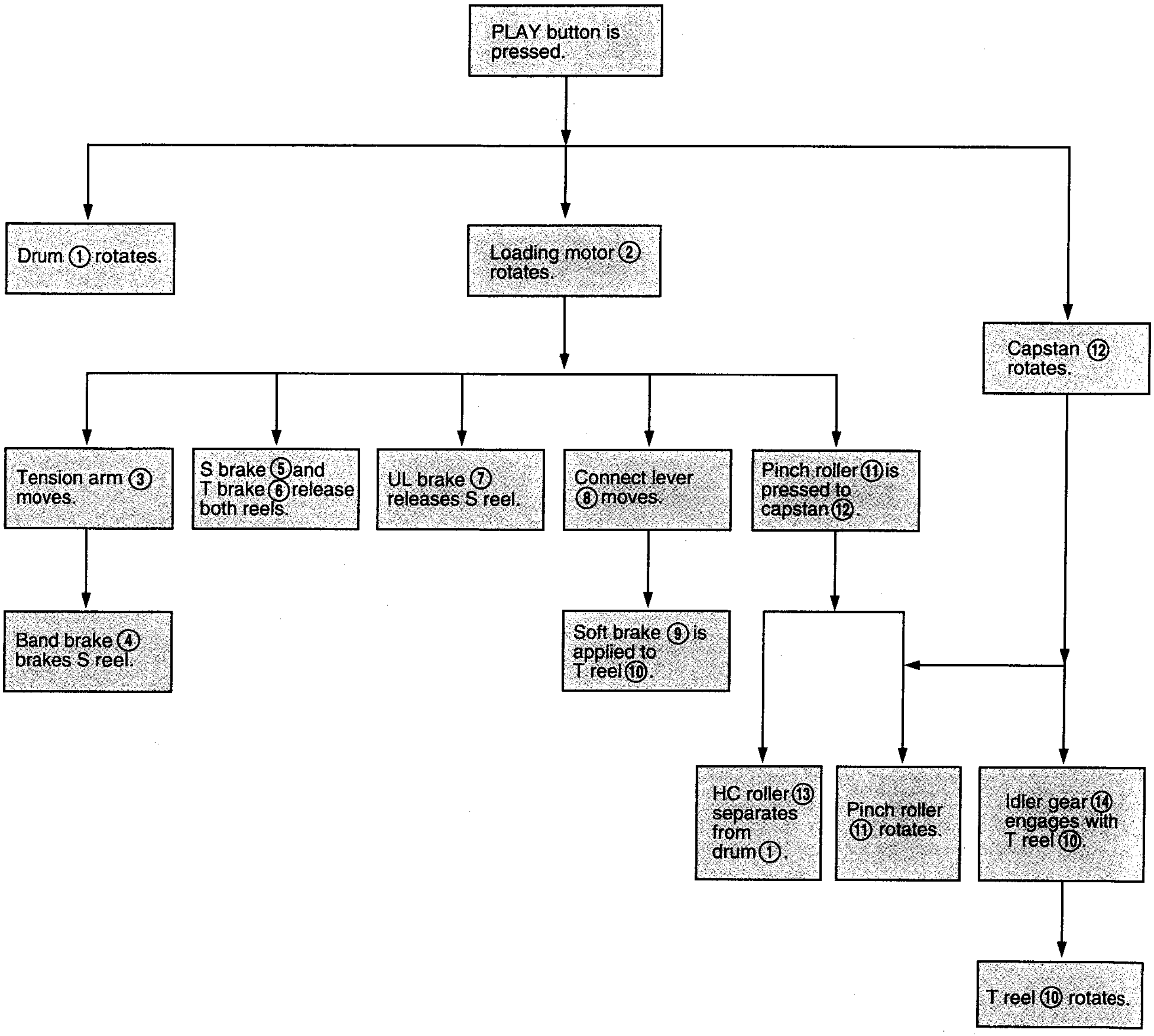

① Drum
⑭ HC roller
⑥ Loading motor
② Capstan
⑫ Tension arm
⑬ Pinch roller
⑱ UL brake
⑰ Soft brake
⑮ Band Brake
⑯ Connect lever
S reel
T reel
⑧ T brake
⑦ S brake

Fig. 14

3-2. PLAY


PLAY button is pressed.
Drum ① rotates.
Loading motor ② rotates.
Capstan ⑫ rotates.
Tension arm ③ moves.
S brake ⑤ and T brake ⑥ release both reels.
UL brake ⑦ releases S reel.
Connect lever ⑧ moves.
Pinch roller ⑪ is pressed to capstan ⑫.
Band brake ④ brakes S reel.
Soft brake ⑨ is applied to T reel ⑩.
HC roller ⑬ separates from drum ①.
Pinch roller ⑪ rotates.
Idler gear ⑭ engages with T reel ⑩.
T reel ⑩ rotates.

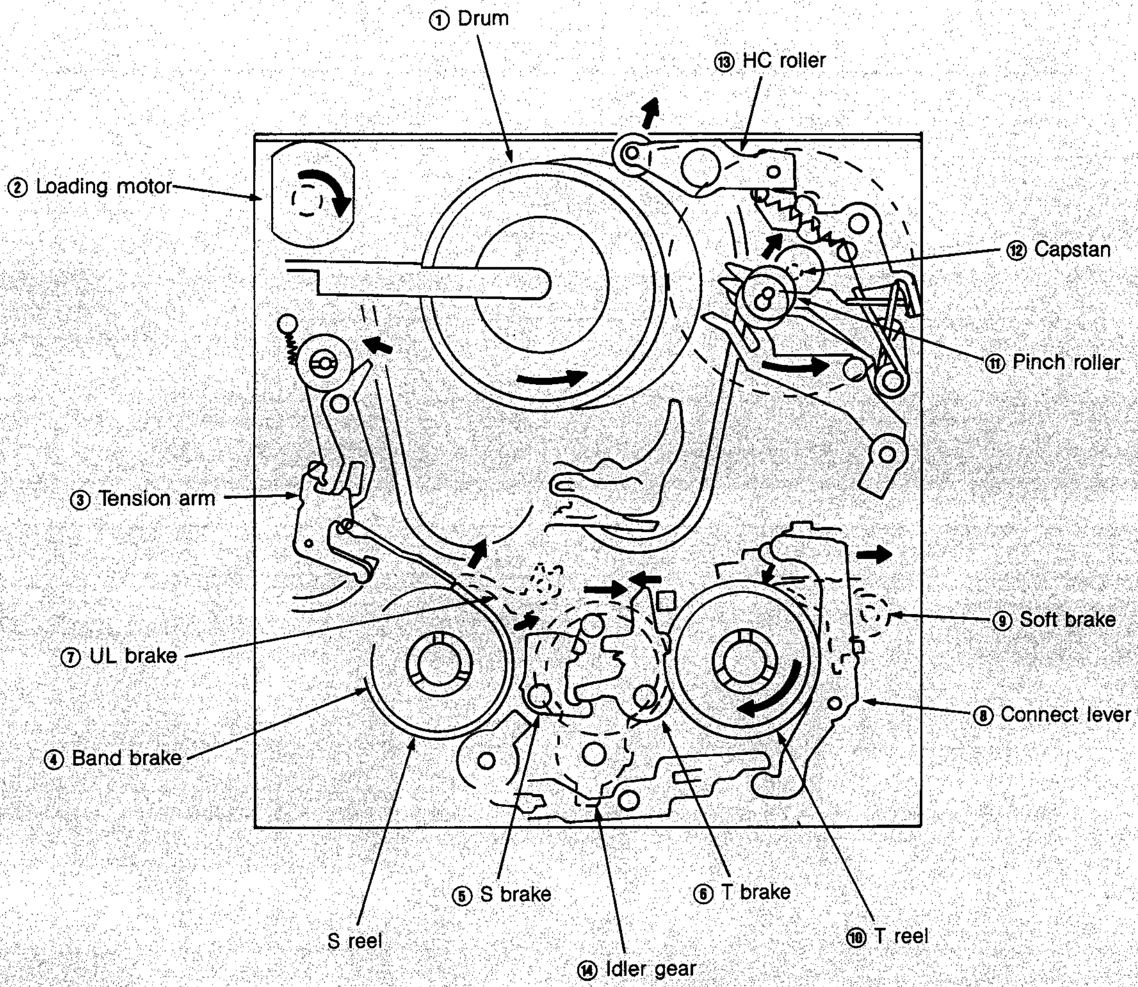

① Drum
⑬ HC roller
② Loading motor
⑫ Capstan
⑪ Pinch roller
③ Tension arm
⑨ Soft brake
⑦ UL brake
⑧ Connect lever
④ Band brake
⑤ S brake
⑥ T brake
S reel
⑩ T reel
⑭ Idler gear

Fig. 15

3-3. TAPE PATH

Tape is pulled out from S reel ①.

Tape tension is made by tension arm ②.

Tape passes through impedance roller ③.

Tape passes through guide roller ④ and is slanted by slant pole S ⑤.

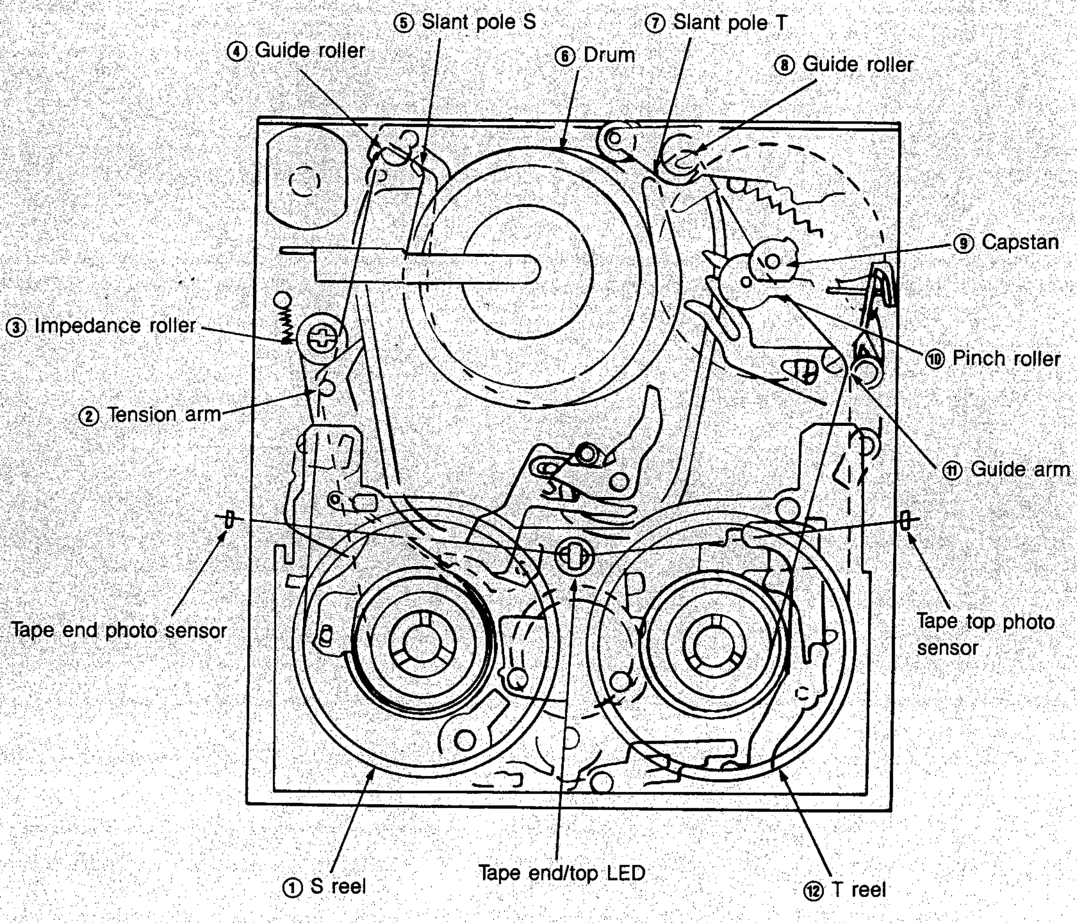
Tape travels around drum ⑥.

Tape is returned at upright position by slant pole T ⑦ and passes through guide roller ⑧.

Tape passes between capstan ⑨ and pinch roller ⑩.

Through guide arm ⑪.

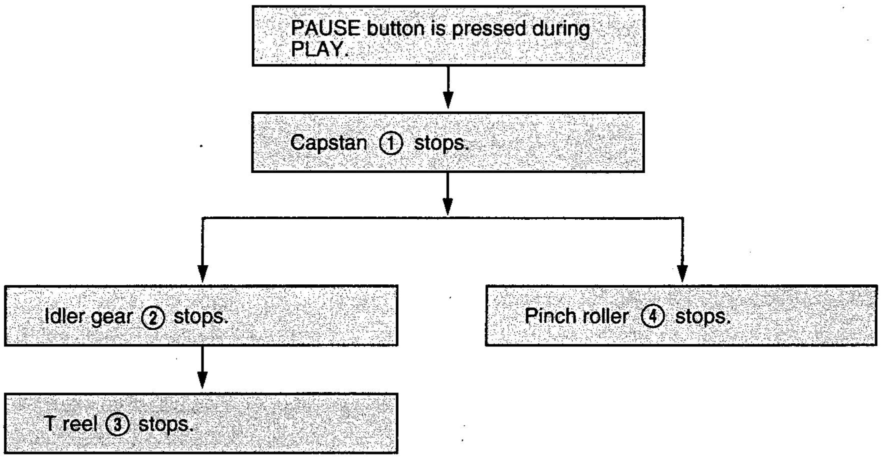
Tape is wound by T reel ⑫.



⑤ Slant pole S
⑦ Slant pole T
④ Guide roller
⑥ Drum
⑧ Guide roller
⑨ Capstan
③ Impedance roller
⑩ Pinch roller
② Tension arm
⑪ Guide arm
Tape end photo sensor
Tape top photo sensor
① S reel
Tape end/top LED
⑫ T reel

Fig. 16

3-4. PLAY PAUSE



PAUSE button is pressed during PLAY.

Capstan ① stops.

Idler gear ② stops.

Pinch roller ④ stops.

T reel ③ stops.

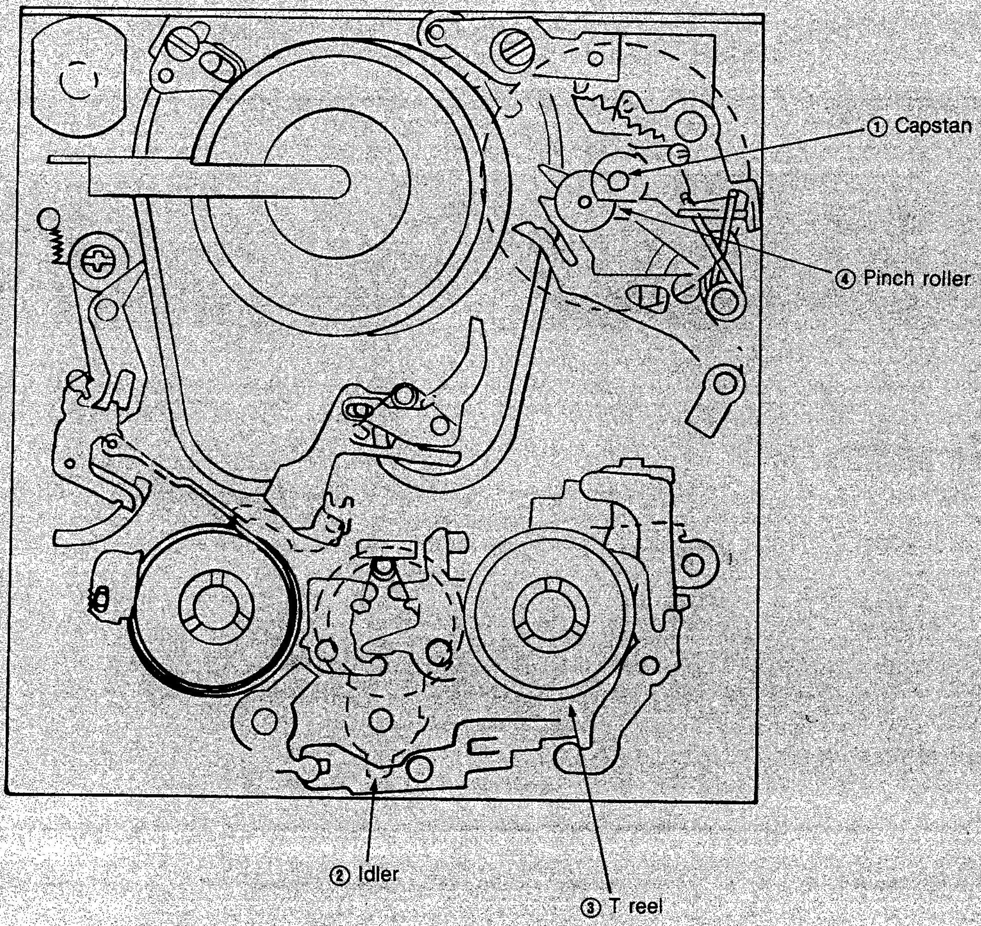
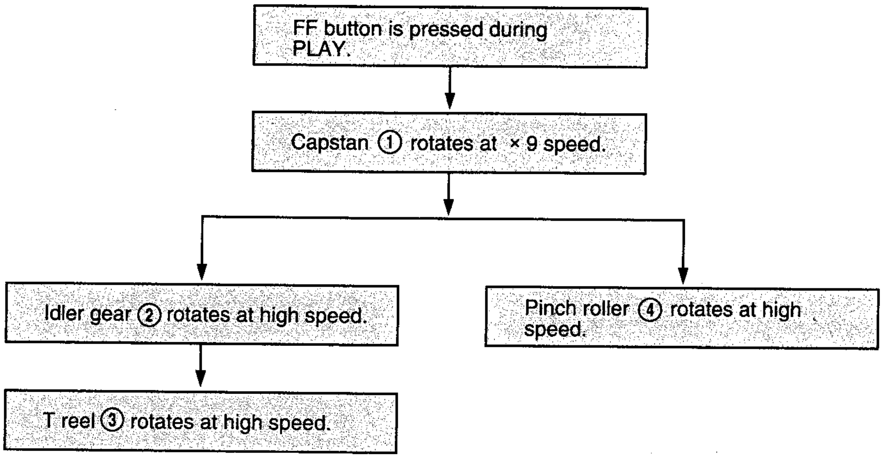

① Capstan
④ Pinch roller
② Idler
③ T reel

Fig. 17

3-5. CUE



FF button is pressed during PLAY.

Capstan ① rotates at × 9 speed.

Idler gear ② rotates at high speed.

T reel ③ rotates at high speed.

Pinch roller ④ rotates at high speed.

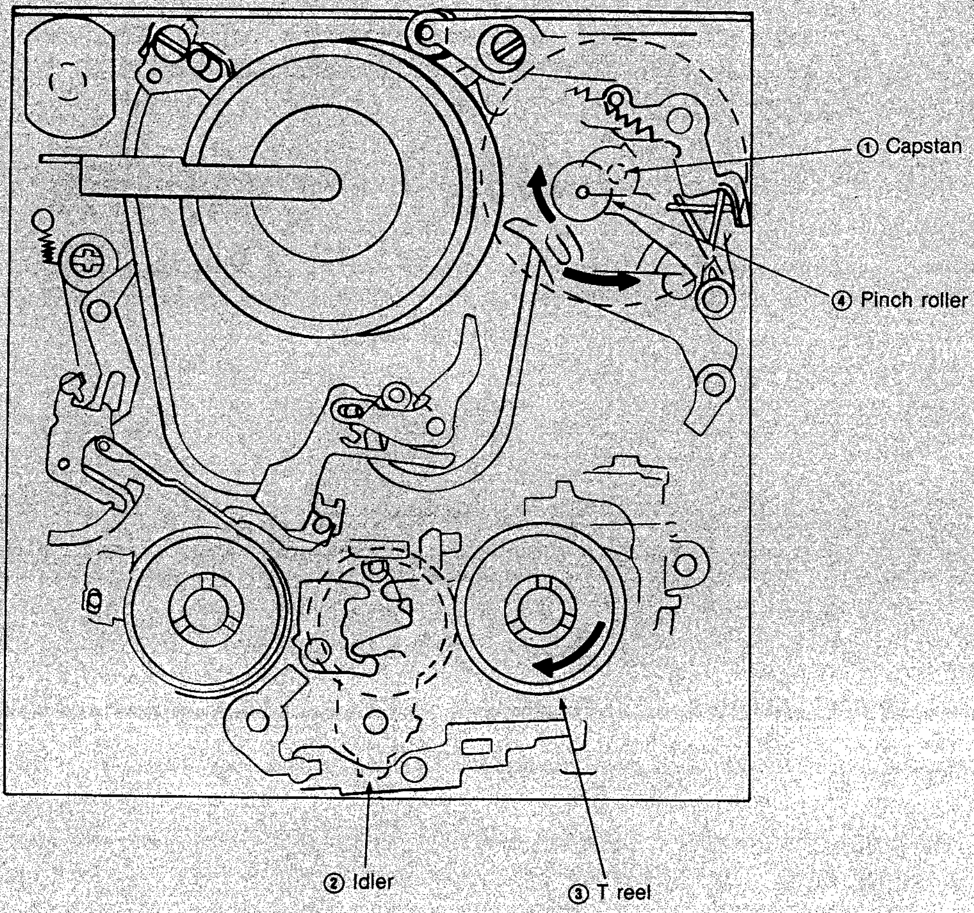
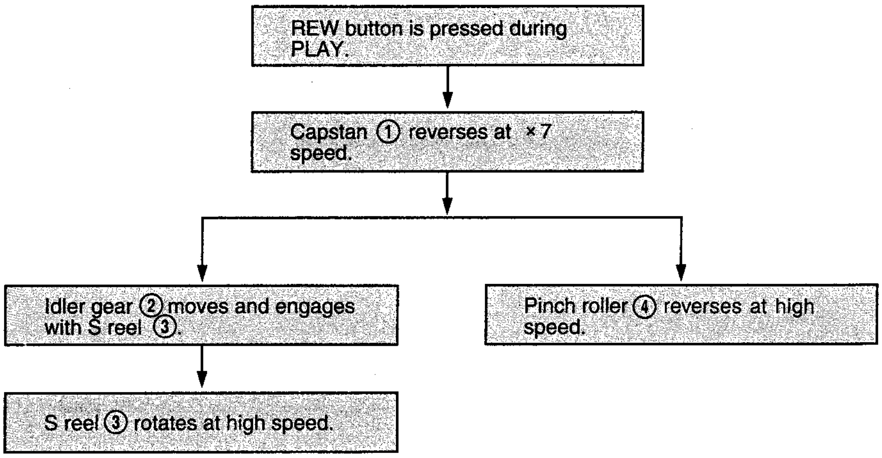

① Capstan
④ Pinch roller
② Idler
③ T reel

Fig. 18

3-6. REV


REW button is pressed during PLAY.

Capstan ① reverses at ×7 speed.

Idler gear ② moves and engages with S reel ③.

S reel ③ rotates at high speed.

Pinch roller ④ reverses at high speed.

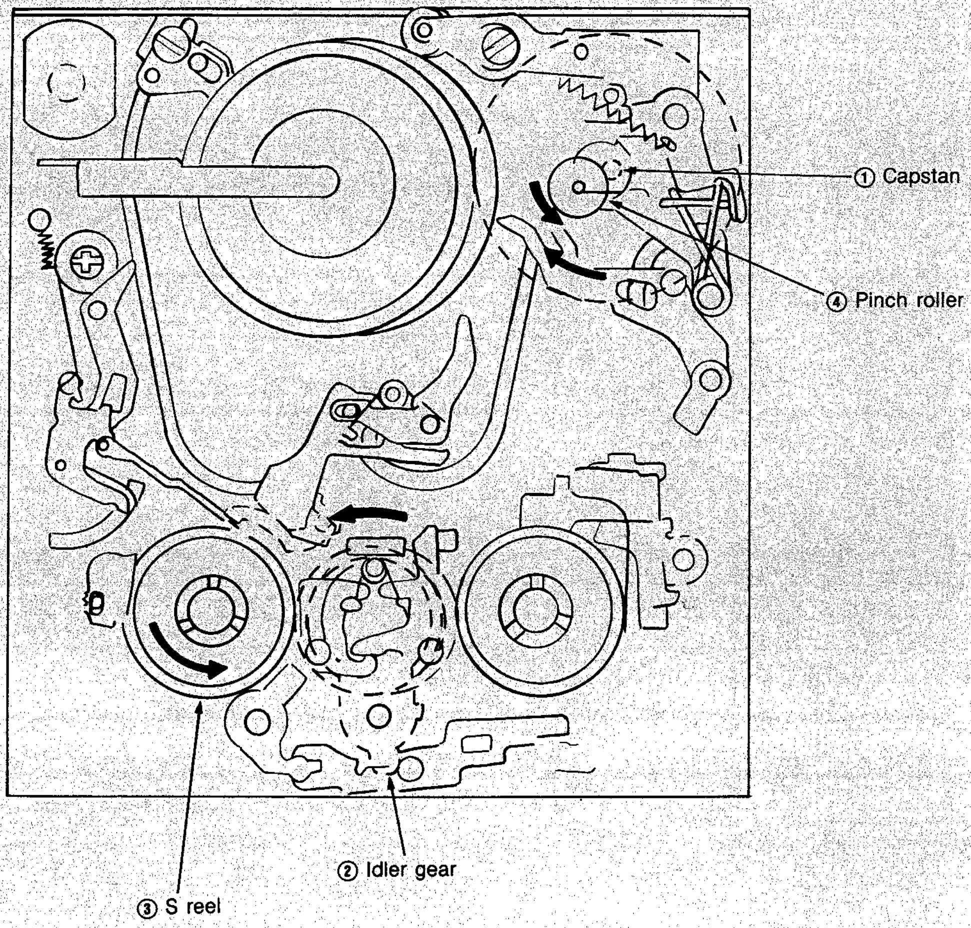
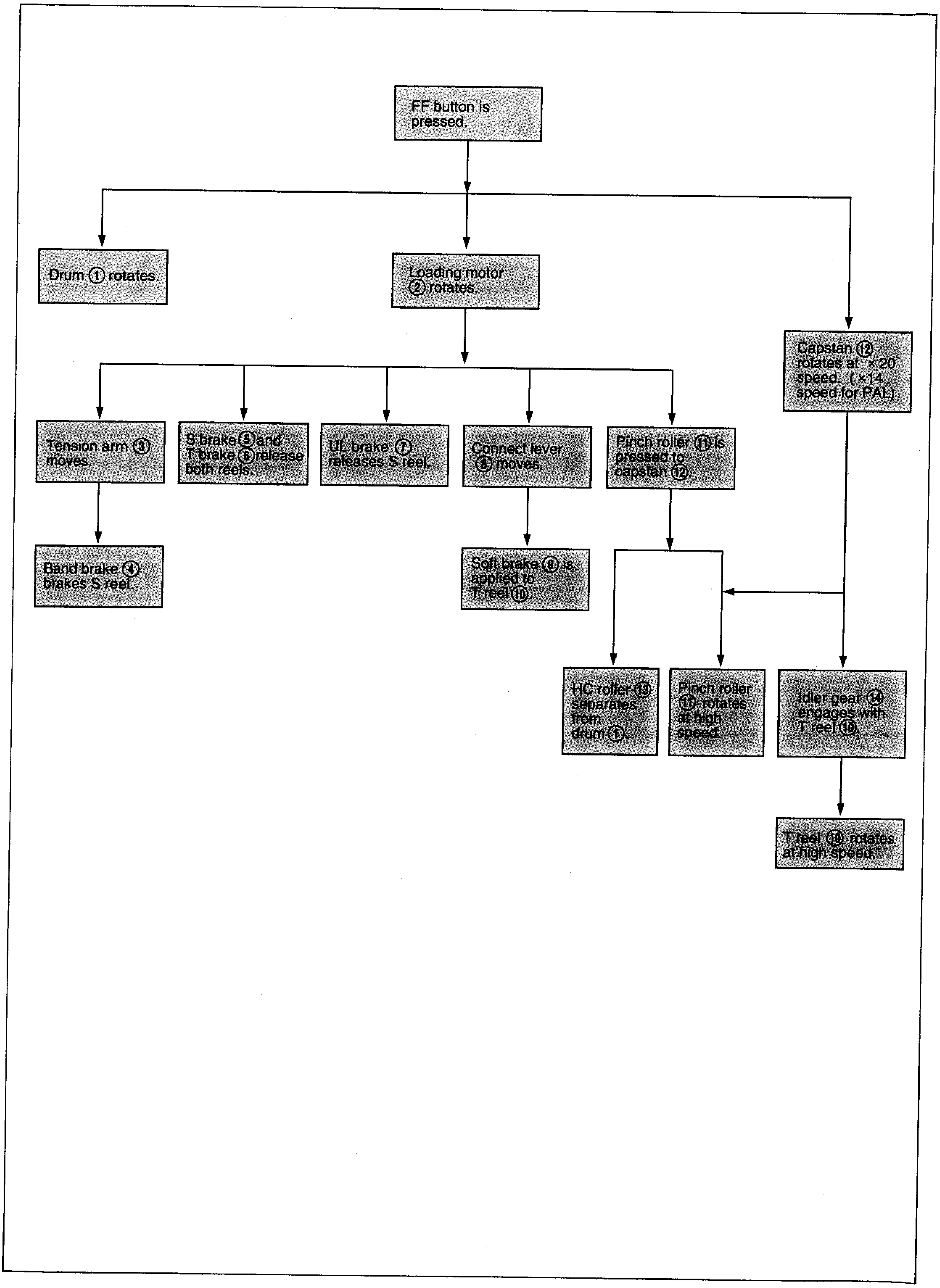

① Capstan
④ Pinch roller
② Idler gear
③ S reel

Fig. 19

3-7. FF


FF button is pressed.
Drum ① rotates.
Loading motor ② rotates.
Capstan ⑫ rotates at ×20 speed. (×14 speed for PAL)
Tension arm ③ moves.
S brake ⑤ and T brake ⑥ release both reels.
UL brake ⑦ releases S reel.
Connect lever ⑧ moves.
Pinch roller ⑪ is pressed to capstan ⑫.
Band brake ④ brakes S reel.
Soft brake ⑨ is applied to T reel ⑩.
HC roller ⑬ separates from drum ①.
Pinch roller ⑪ rotates at high speed.
Idler gear ⑭ engages with T reel ⑩.
T reel ⑩ rotates at high speed.

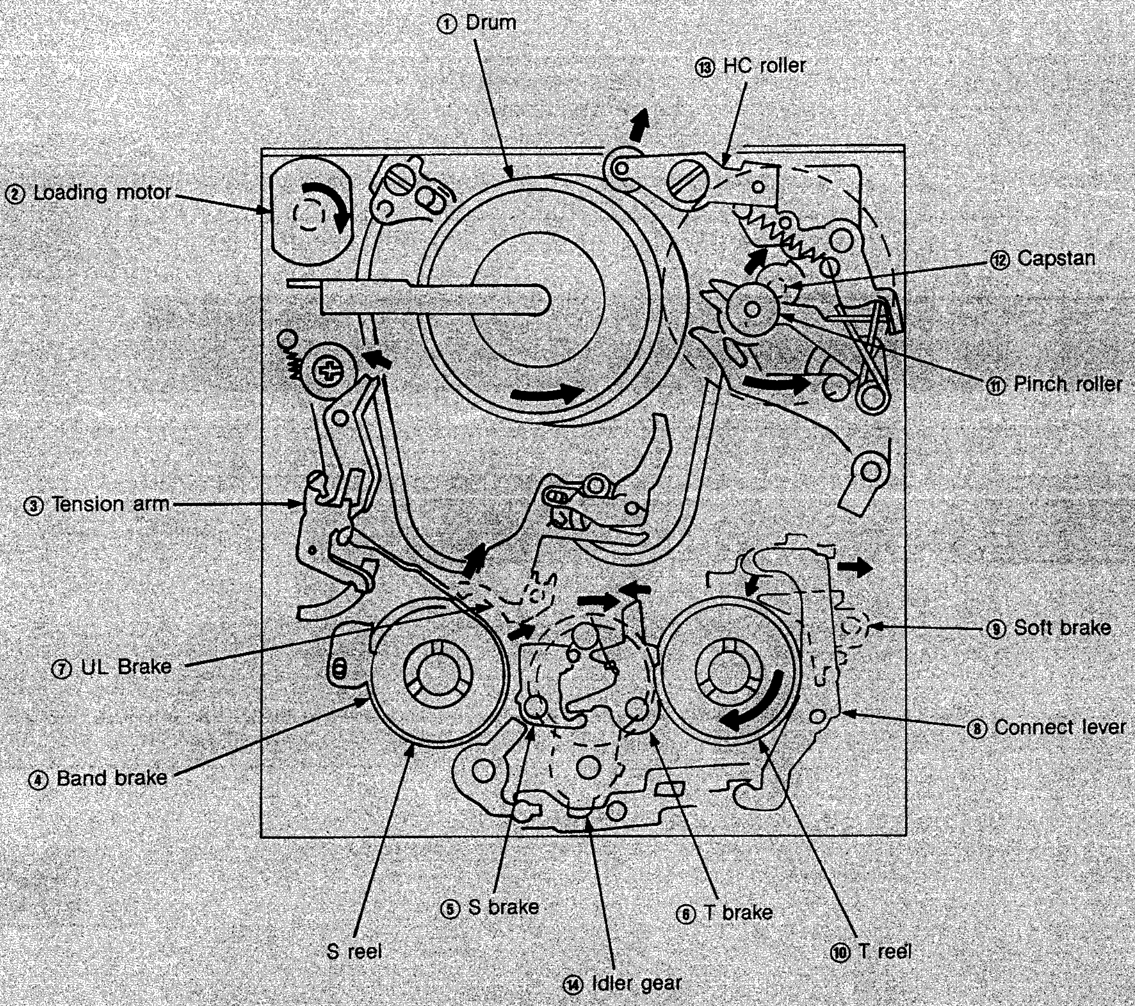
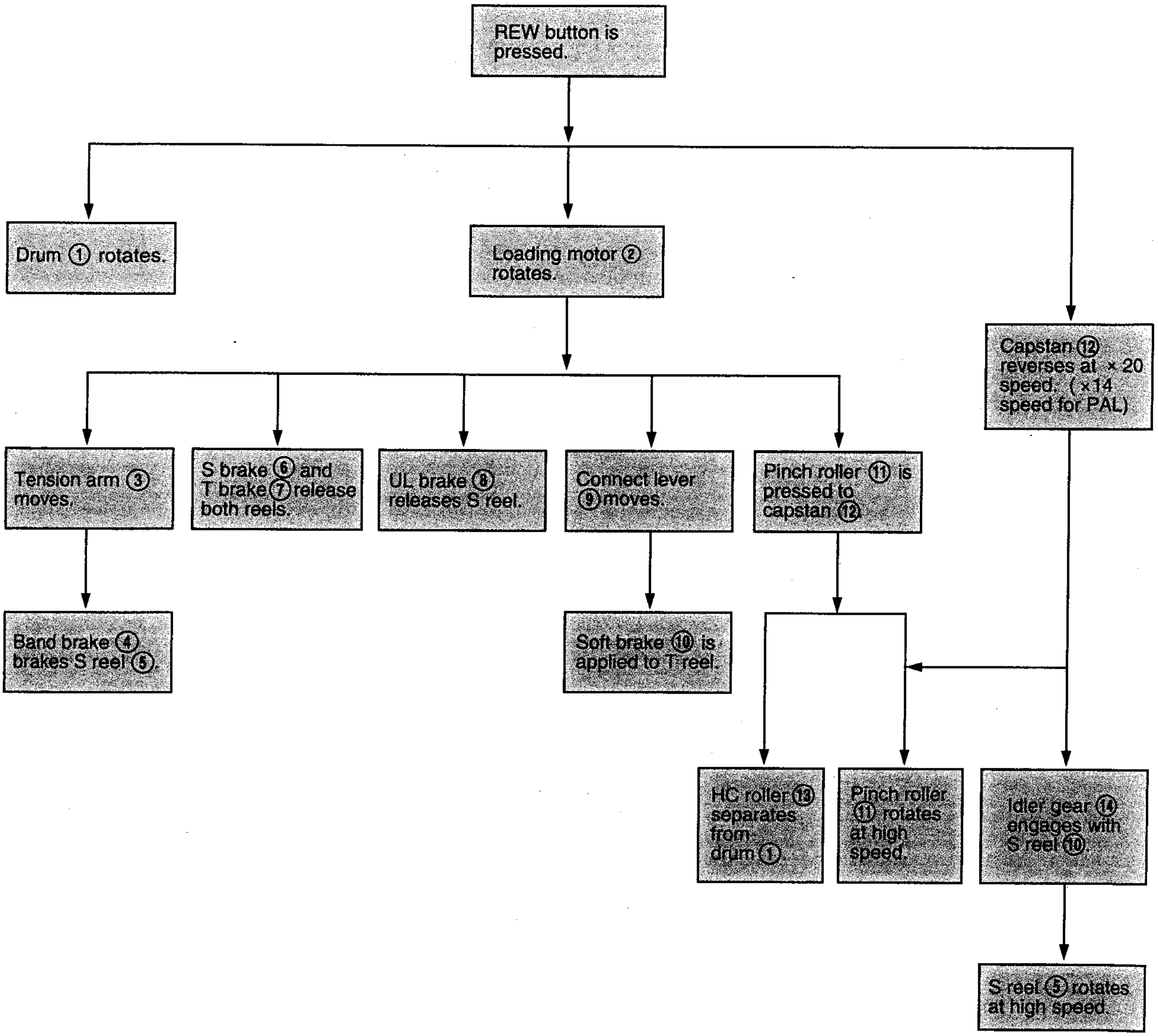

① Drum
⑬ HC roller
② Loading motor
⑫ Capstan
⑪ Pinch roller
③ Tension arm
⑨ Soft brake
⑦ UL Brake
⑧ Connect lever
④ Band brake
⑤ S brake
⑥ T brake
S reel
⑩ T reel
⑭ Idler gear

Fig. 20

3-8. REW


REW button is pressed.
Drum ① rotates.
Loading motor ② rotates.
Capstan ⑫ reverses at × 20 speed. (×14 speed for PAL)
Tension arm ③ moves.
S brake ⑥ and T brake ⑦ release both reels.
UL brake ⑧ releases S reel.
Connect lever ⑨ moves.
Pinch roller ⑪ is pressed to capstan ⑫.
Band brake ④ brakes S reel ⑤.
Soft brake ⑩ is applied to T reel.
HC roller ⑬ separates from drum ①.
Pinch roller ⑪ rotates at high speed.
Idler gear ⑭ engages with S reel ⑩.
S reel ⑤ rotates at high speed.

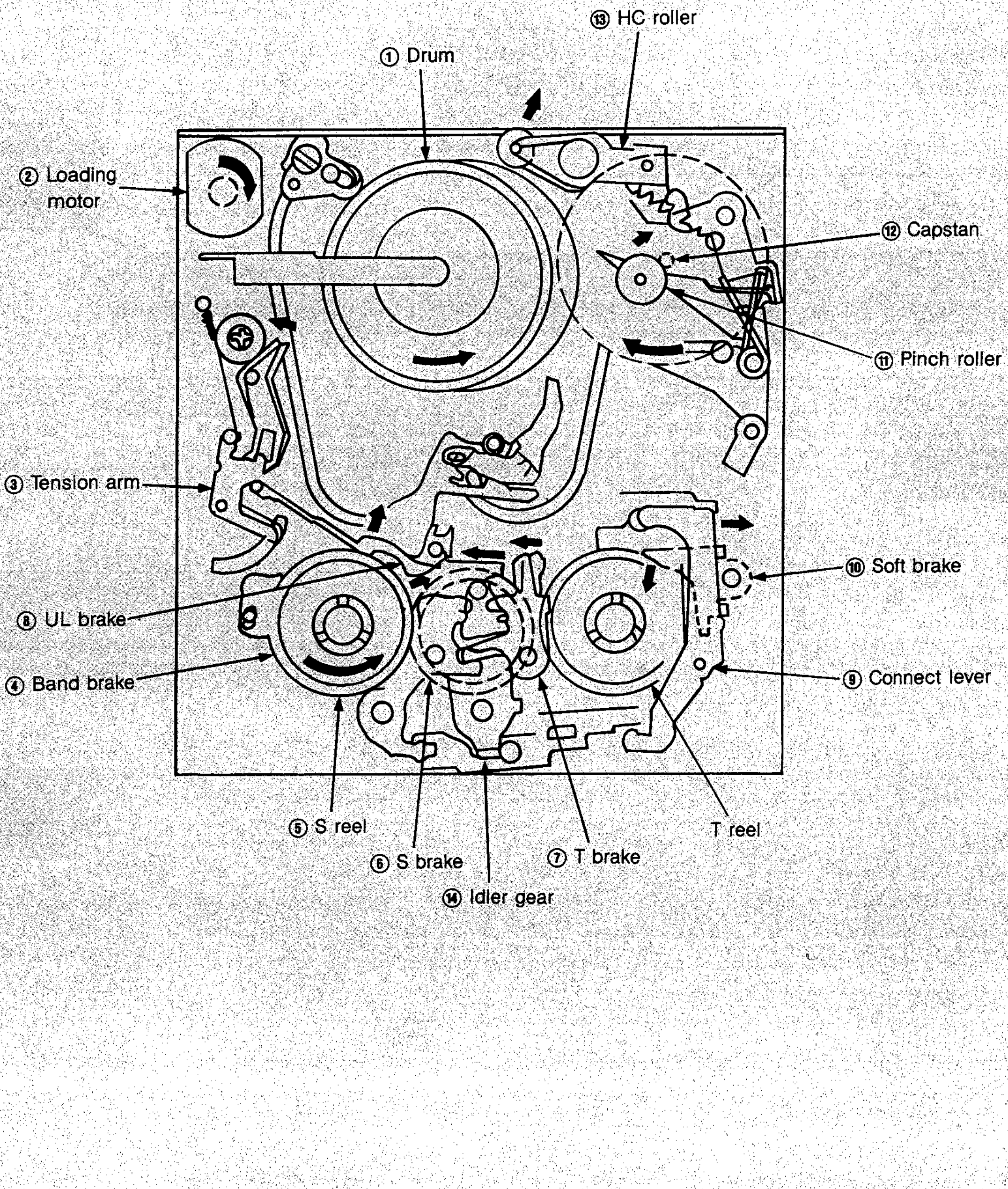
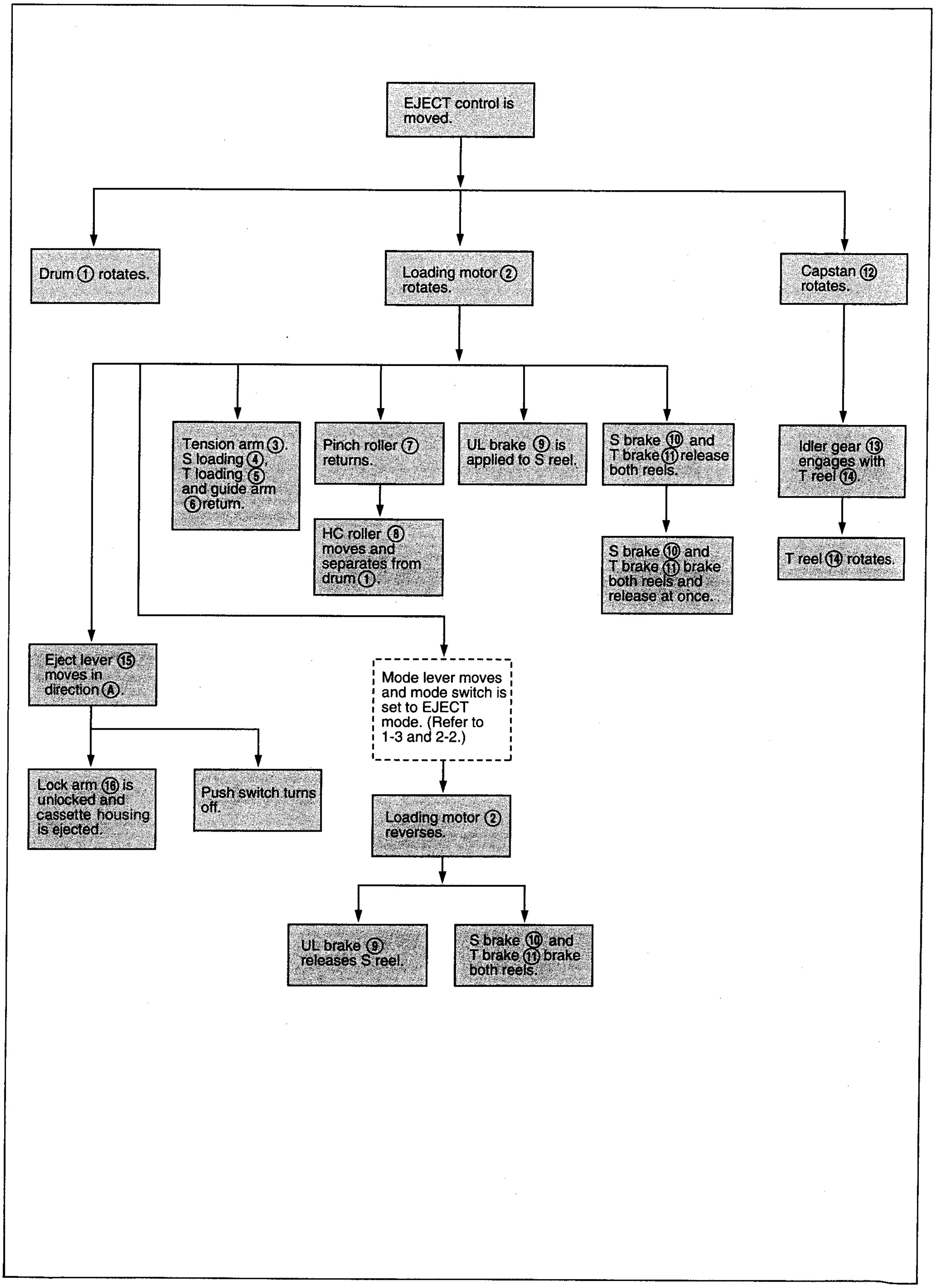

⑬ HC roller
① Drum
② Loading motor
⑫ Capstan
⑪ Pinch roller
③ Tension arm
⑩ Soft brake
⑧ UL brake
④ Band brake
⑨ Connect lever
⑤ S reel
T reel
⑥ S brake
⑦ T brake
⑭ Idler gear

Fig. 21

3-9. EJECT


EJECT control is moved.
Drum ① rotates.
Loading motor ② rotates.
Capstan ⑫ rotates.
Tension arm ③, S loading ④, T loading ⑤ and guide arm ⑥ return.
Pinch roller ⑦ returns.
UL brake ⑨ is applied to S reel.
S brake ⑩ and T brake ⑪ release both reels.
Idler gear ⑬ engages with T reel ⑭.
HC roller ⑧ moves and separates from drum ①.
S brake ⑩ and T brake ⑪ brake both reels and release at once.
T reel ⑭ rotates.
Eject lever ⑮ moves in direction Ⓐ.
Mode lever moves and mode switch is set to EJECT mode. (Refer to 1-3 and 2-2.)
Lock arm ⑯ is unlocked and cassette housing is ejected.
Push switch turns off.
Loading motor ② reverses.
UL brake ⑨ releases S reel.
S brake ⑩ and T brake ⑪ brake both reels.

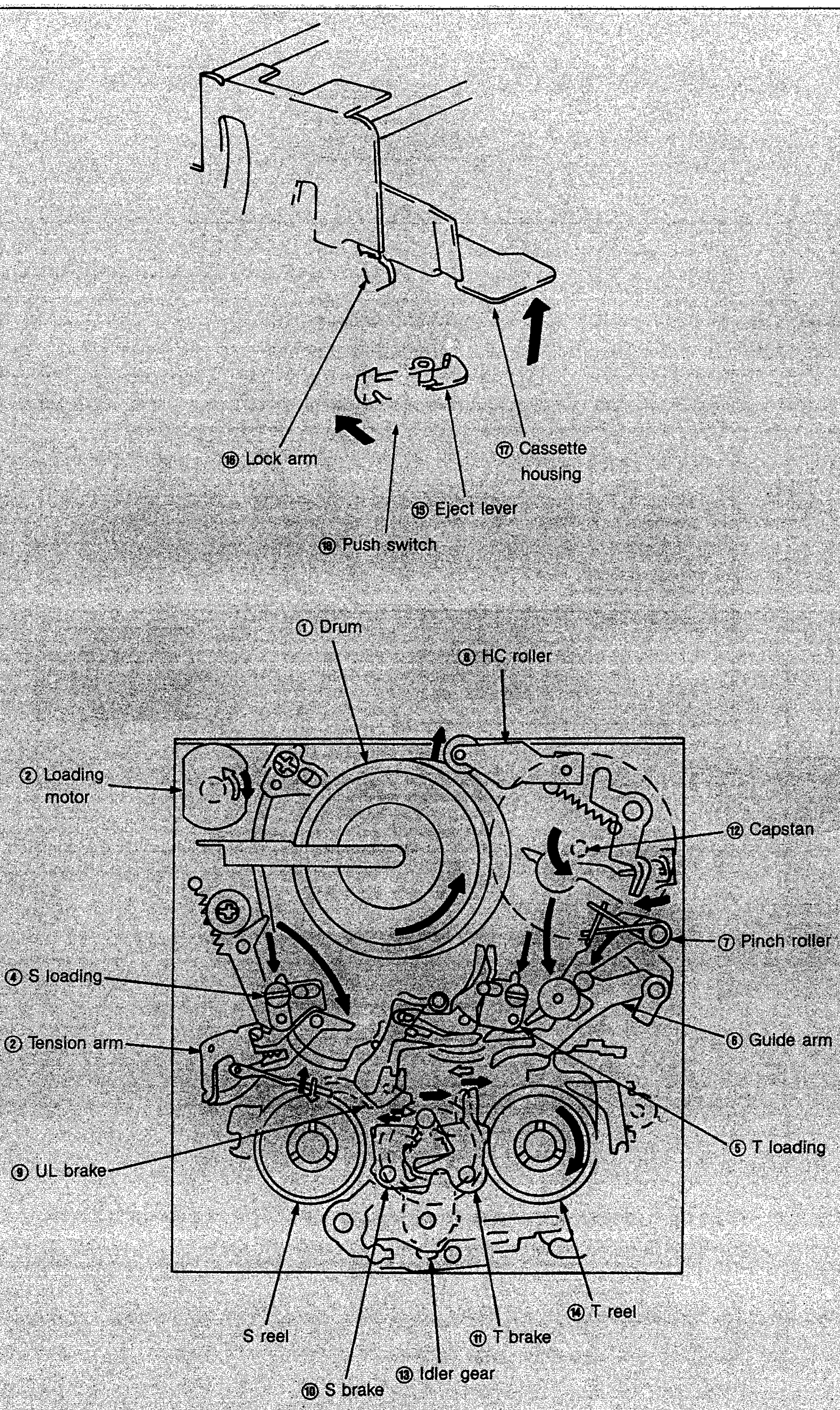

⑯ Lock arm
⑰ Cassette housing
⑮ Eject lever
⑱ Push switch
① Drum
⑧ HC roller
② Loading motor
⑫ Capstan
⑦ Pinch roller
④ S loading
② Tension arm
⑥ Guide arm
⑤ T loading
⑨ UL brake
⑭ T reel
S reel
⑪ T brake
⑬ Idler gear
⑩ S brake

Fig. 22

SECTION 4
FUNCTION MODE TRANSITION TABLE

Next Mode Current Mode	STOP	PLAY	REC	PAUSE	FF	REW	EJECT
STOP	—	PLAY	REC	—	FF	REW	EJECT
PLAY	STOP	—	—	PLAY PAUSE	CUE	REV	EJECT
REC	STOP	—	—	REC PAUSE	—	—	—
PLAY PAUSE	STOP	PLAY	REC PAUSE	PLAY	CUE	REV	EJECT
REC PAUSE	STOP	—	—	REC	—	—	—
FF	STOP	PLAY	—	—	CUE	REW	EJECT
REW	STOP	PLAY	—	—	FF	REV	EJECT

PART II
8mm A-MECHANISM ADJUSTMENT MANUAL

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1. PREPARATIONS FOR MECHANICL BLOCK CHECK, ADJUSTMENT AND REPLACEMENT

Note: For removal of the cabinet, the boards, the cassette housing, etc., refer to the service guides.

1-1. OPERATION WITHOUT CASSETTE HOUSING ASSEMBLY AND TAPE

Note: The unit will not work if exposed to a strong light.

1-1-1. How to Trigger the Loading Operation (See Fig. 1-1).

1) Supply power to the unit after removing the cabinet, the camera block, the cassette housing assembly, etc., as indicated in the service guides. (This will enable operation of the mechanical deck).
2) Cover the LED assembly with an opaque cap, etc. ①.
3) Attach a piece of tape to the RECOG switch ② so that the pin is held down.
4) Push the EJECT lever ③ in the direction of the arrow Ⓐ

1-1-2. Setting the Playback Mode (See Fig. 1-1.)

1) Follow the procedures in section 1-1-1. above
2) Put the rubber band ④ around the S and T reels.
3) Press the PLAY switch of unit, then push the tension arm assembly ⑤ in the direction of the arrow Ⓑ when the T reel starts to rotate (the band brake will be released, and the S reel will start rotating).
4) To stop operation, press the STOP switch.

1-1-3. Eject Operation (See Fig. 1-1).

1) To eject, turn the EJECT switch on.

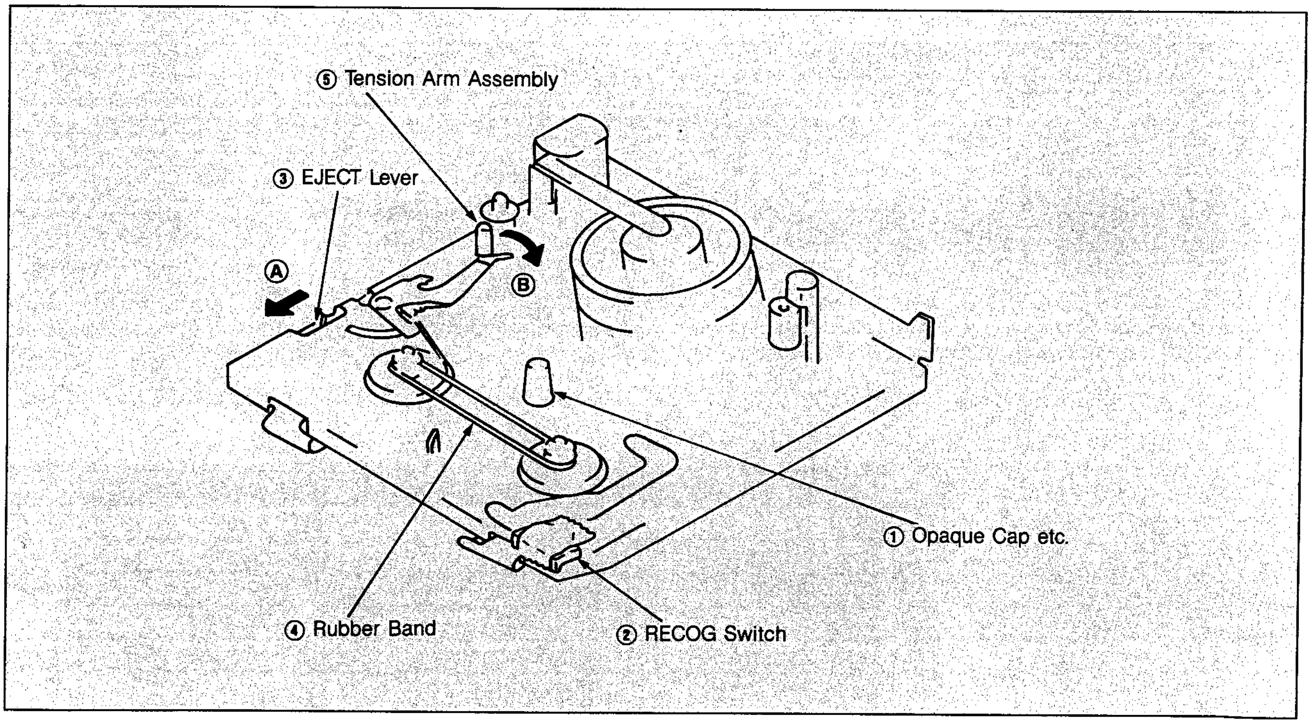
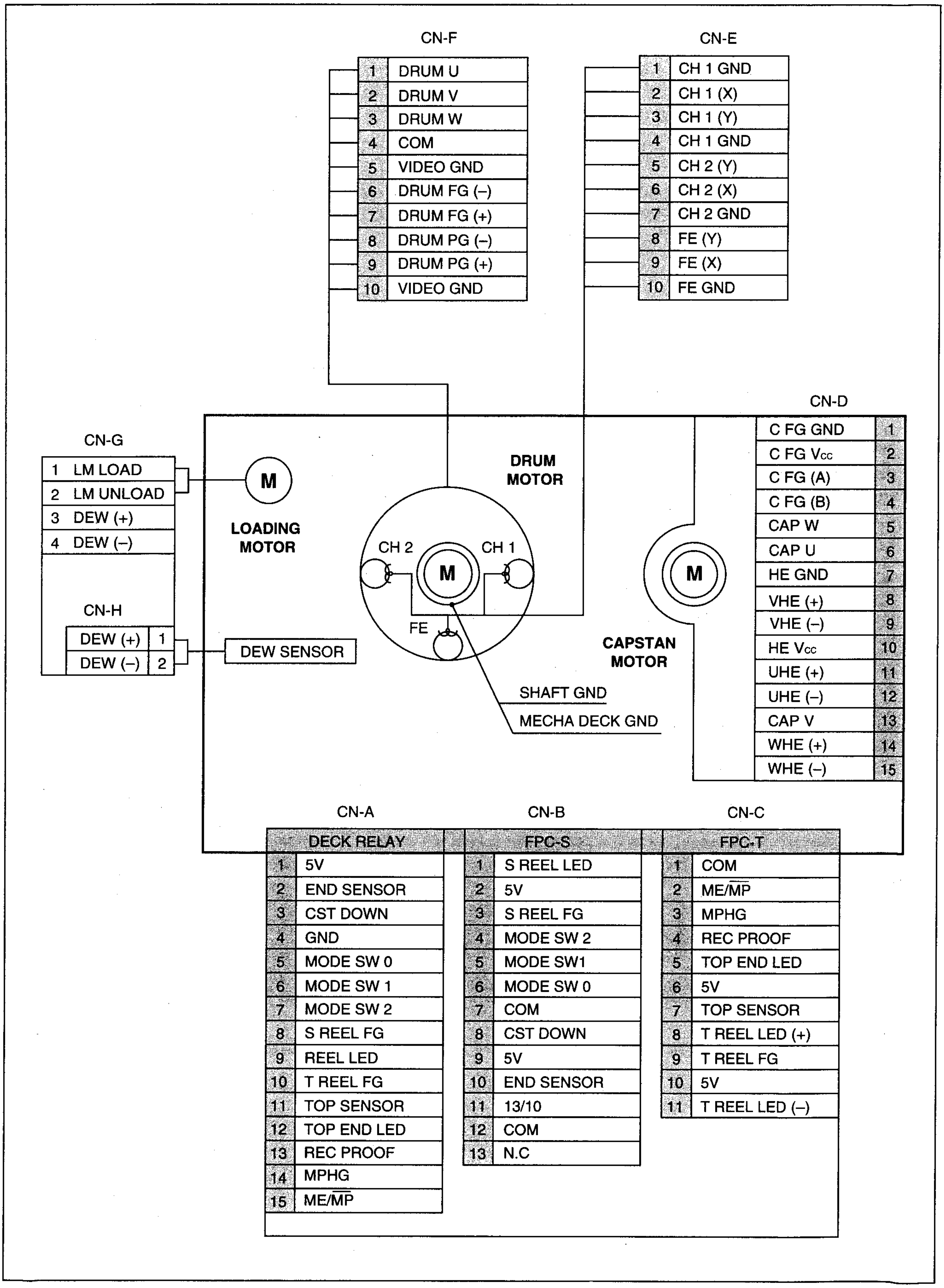


Fig. 1-1

1-2 A-MECHA (CAMCORDER) CONNECTOR DIAGRAM


DRUM MOTOR
LOADING MOTOR
CAPSTAN MOTOR
M
CH 2
CH 1
FE
DEW SENSOR
SHAFT GND
MECHA DECK GND

CN-F

1	DRUM U
2	DRUM V
3	DRUM W
4	COM
5	VIDEO GND
6	DRUM FG (–)
7	DRUM FG (+)
8	DRUM PG (–)
9	DRUM PG (+)
10	VIDEO GND

CN-E

1	CH 1 GND
2	CH 1 (X)
3	CH 1 (Y)
4	CH 1 GND
5	CH 2 (Y)
6	CH 2 (X)
7	CH 2 GND
8	FE (Y)
9	FE (X)
10	FE GND

CN-G

1	LM LOAD
2	LM UNLOAD
3	DEW (+)
4	DEW (–)

CN-H

DEW (+)	1
DEW (–)	2

CN-D

C FG GND	1
C FG V_{CC}	2
C FG (A)	3
C FG (B)	4
CAP W	5
CAP U	6
HE GND	7
VHE (+)	8
VHE (–)	9
HE V_{CC}	10
UHE (+)	11
UHE (–)	12
CAP V	13
WHE (+)	14
WHE (–)	15

CN-A

DECK RELAY	
1	5V
2	END SENSOR
3	CST DOWN
4	GND
5	MODE SW 0
6	MODE SW 1
7	MODE SW 2
8	S REEL FG
9	REEL LED
10	T REEL FG
11	TOP SENSOR
12	TOP END LED
13	REC PROOF
14	MPHG
15	ME/$\overline{\text{MP}}$

CN-B

FPC-S	
1	S REEL LED
2	5V
3	S REEL FG
4	MODE SW 2
5	MODE SW1
6	MODE SW 0
7	COM
8	CST DOWN
9	5V
10	END SENSOR
11	13/10
12	COM
13	N.C

CN-C

FPC-T	
1	COM
2	ME/$\overline{\text{MP}}$
3	MPHG
4	REC PROOF
5	TOP END LED
6	5V
7	TOP SENSOR
8	T REEL LED (+)
9	T REEL FG
10	5V
11	T REEL LED (–)

2. PERIODICAL CHECK AND MAINTENANCE (See Fig. 2-1)

The following periodical check and maintenance procedures are necessary to ensure proper operation and to protect the tapes as well as the unit, and the following maintenance procedures must be always carried out after repairing regardless of how long the unit has been used.

2-1. ROTARY DRUM ASSEMBLY CLEANING

1) While pressing a piece of chamois leather (Servicing tools No. 2) moistened in cleaning fluid (Servicing tools No. 1) lightly against the rotary drum, turn the rotary upper drum slowly counterclockwise with your fingers.

Note: Do not drive the drum with the motor, and do not turn it clockwise with your fingers.
Do not move the chamois leather vertically against the head tip: this can damage the head tip. Strictly follow the cleaning instructions above.

2-2. TAPE PATH CLEANING

1) Set the cassette housing assembly to the eject state, or remove it. Then clean the tape path (guides No. 1 to 7, capstan shaft, pinch roller) with a piece of chamois leather moistened in cleaning fluid (See Fig. 2-1).

2-3. DRIVE SYSTEM CLEANING

1) Clean the drive system (timing belt, reel table surface) with a piece of cloth moistened in cleaning fluid.

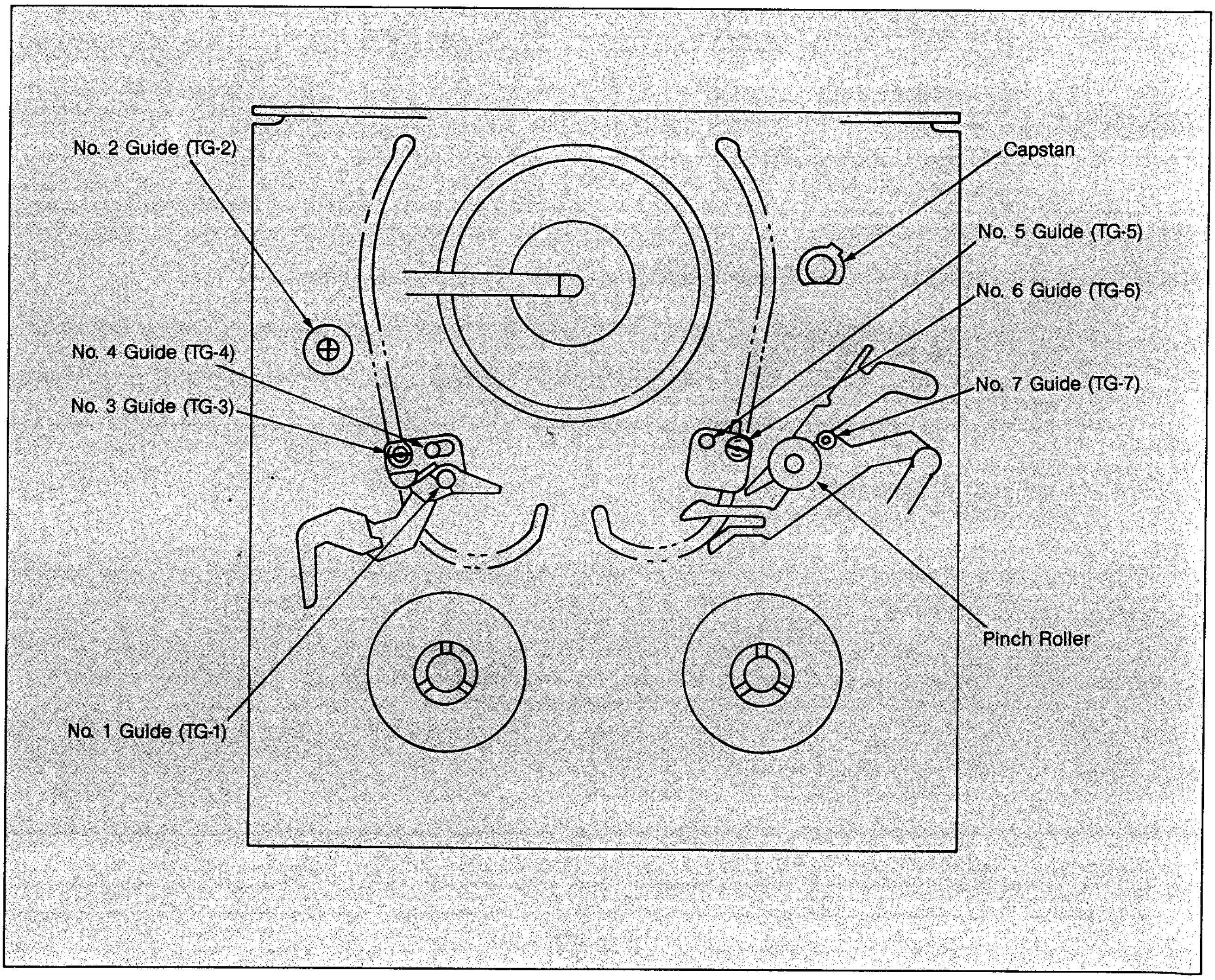


Fig. 2-1

2-4. PERIODICAL CHECK ITEMS

○ Cleaning ◎ Lubrication ★ Check

Maintenance and Check Item		Operation time (H)										Remarks
		500	1,000	1,500	2,000	2,500	3,000	3,500	4,000	4,500	5,000	
Cleaning and Demagnetizing	Tape path surfaces Cleaning	○	○	○	○	○	○	○	○	○	○	Do not oil.
	Rotary drum assembly cleaning and demagnetizing	○	○	○	○	○	○	○	○	○	○	Do not oil
Drive System	Relay belt (short)	—	☆	—	☆	—	☆	—	☆	—	☆	97S5501900
	Relay belt (long)	—	☆	—	☆	—	☆	—	☆	—	☆	97S5502000
	Capstan shaft	—	◎	—	◎	—	◎	—	◎	—	◎	Take care that no oil gets on tape path surfaces.
	Idler pulley axle	—	◎	—	◎	—	◎	—	◎	—	◎	
	Loading motor	—	☆	—	☆	—	☆	—	☆	—	☆	97SB371000
Performance Check	Abnormal noise	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	
	Back tension measurement	—	☆	—	☆	—	☆	—	☆	—	☆	
	Brake system	—	☆	—	☆	—	☆	—	☆	—	☆	
	FWD, RVS torque measurement	—	☆	—	☆	—	☆	—	☆	—	☆	

Notes: When overhauling the unit, perform parts replacement refering to the table above.

Regarding Oil:

- Always use the specified oil (using oil of different viscosity, etc. can cause troubles of several kinds). Specified oil: Part No. 2291290002
- Be sure that no dirt is mixed in the oil to be used on axle bearings. Use of dirty oil can result in bearing wear and burning.
- By "one drop of oil" is meant the quantity of oil adhering to the end of a 2mm-diameter rod as shown in Fig. 2-2.

On grease:

- Use the specified grease.
  Grease: Part No. 2291130403

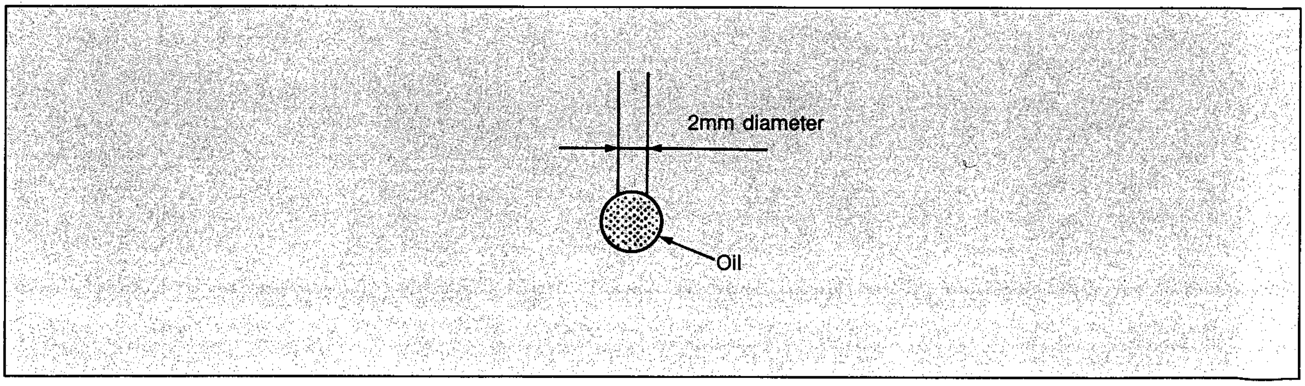
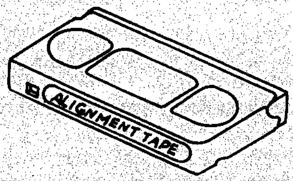


Fig. 2-2

2-5. SERVICING TOOLS

No	Name	Part Code	Remark
1	Alignment tape NTSC (WR5-1NP) PAL (WR5-1CP)	592WR51NP- 592WR51CP-	Tape path
2	FWD/RVS torque cassette	8T-032	
3	Cleaning fluid		Ethyl alcohol
4	Chamois cloth		
5	Dental mirror		Tape path
6	Rotary drum jig	(Attached to the maintenance rotary upper drum)	
7-1 7-2 7-3	+ Driver − Driver Tape path adjusting driver		

①



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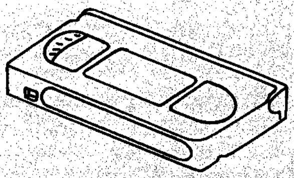

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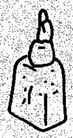

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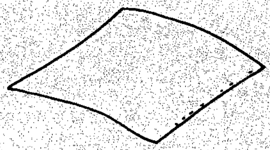

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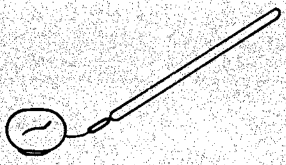

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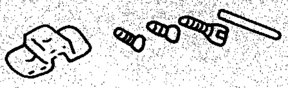
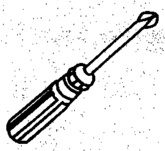
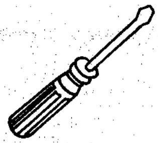


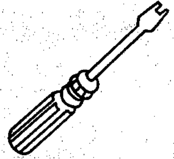
⑦-1



⑦-2



⑦-3



3. MECHANICAL BLOCK CHECK, ADJUSTMENT AND REPLACEMENT

3-1. HC ROLLER ASSEMBLY

1. Removal (See Fig. 3-1.)

1) Remove the screw ① then remove the HC roller assembly ②.

2. Installation (See Fig. 3-1.)

1) Align the two dowels ③ attached to the HC roller assembly ② with the two holes ④ in the mechanism chassis.
2) Secure the HC roller assembly ② with the screw ①.

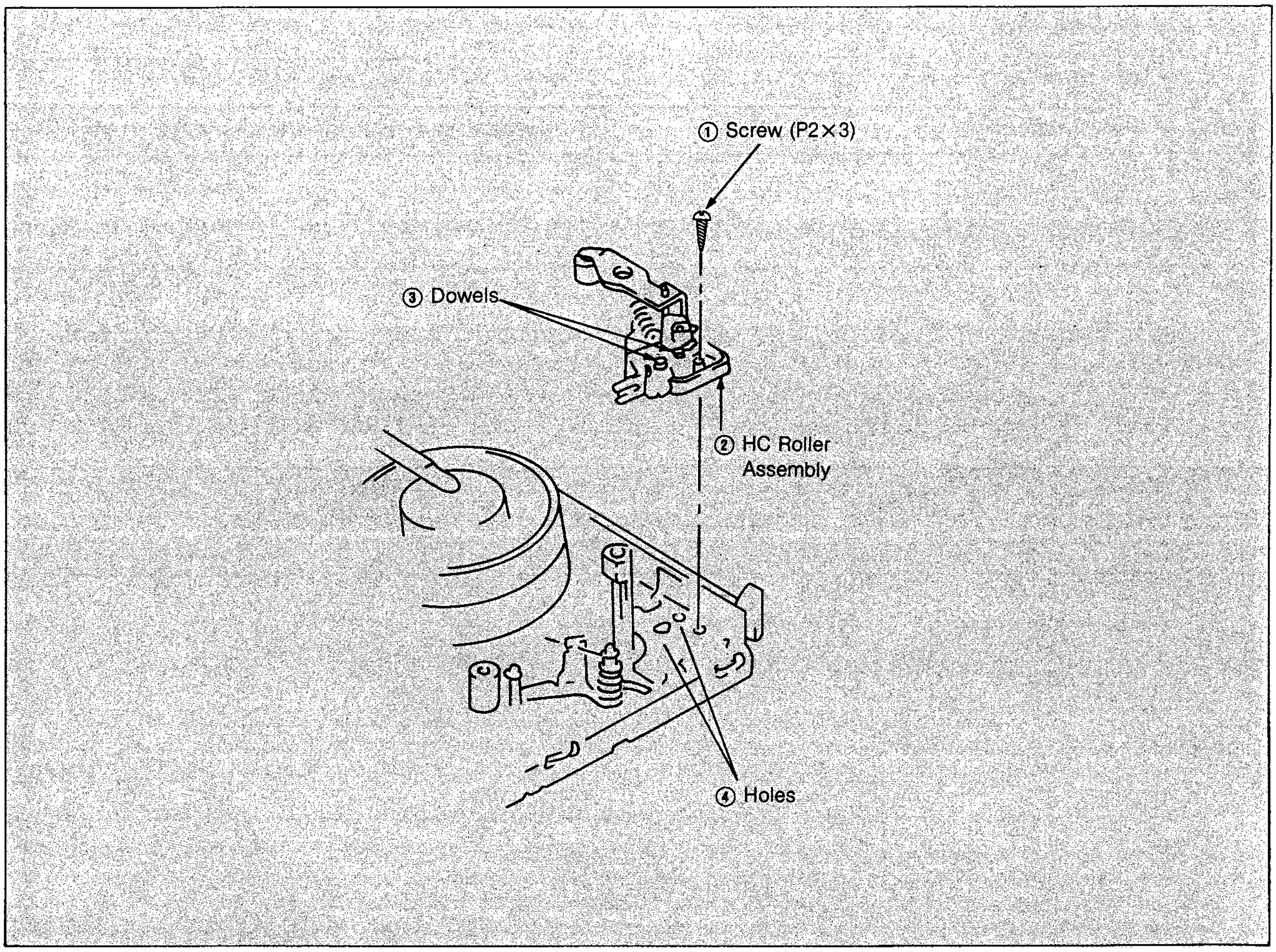

① Screw (P2×3)
③ Dowels
② HC Roller Assembly
④ Holes

Fig. 3-1

3-2. PROTECT COVER

1. Remove (See Fig. 3-2.)

Remove the screw ① then remove the protect cover ②

2. Installation (See Fig. 3-2.)

1) Align the dowel ③ attached to the protect cover ② with the hole ④.
2) Secure the protect cover ② with the screw ①.

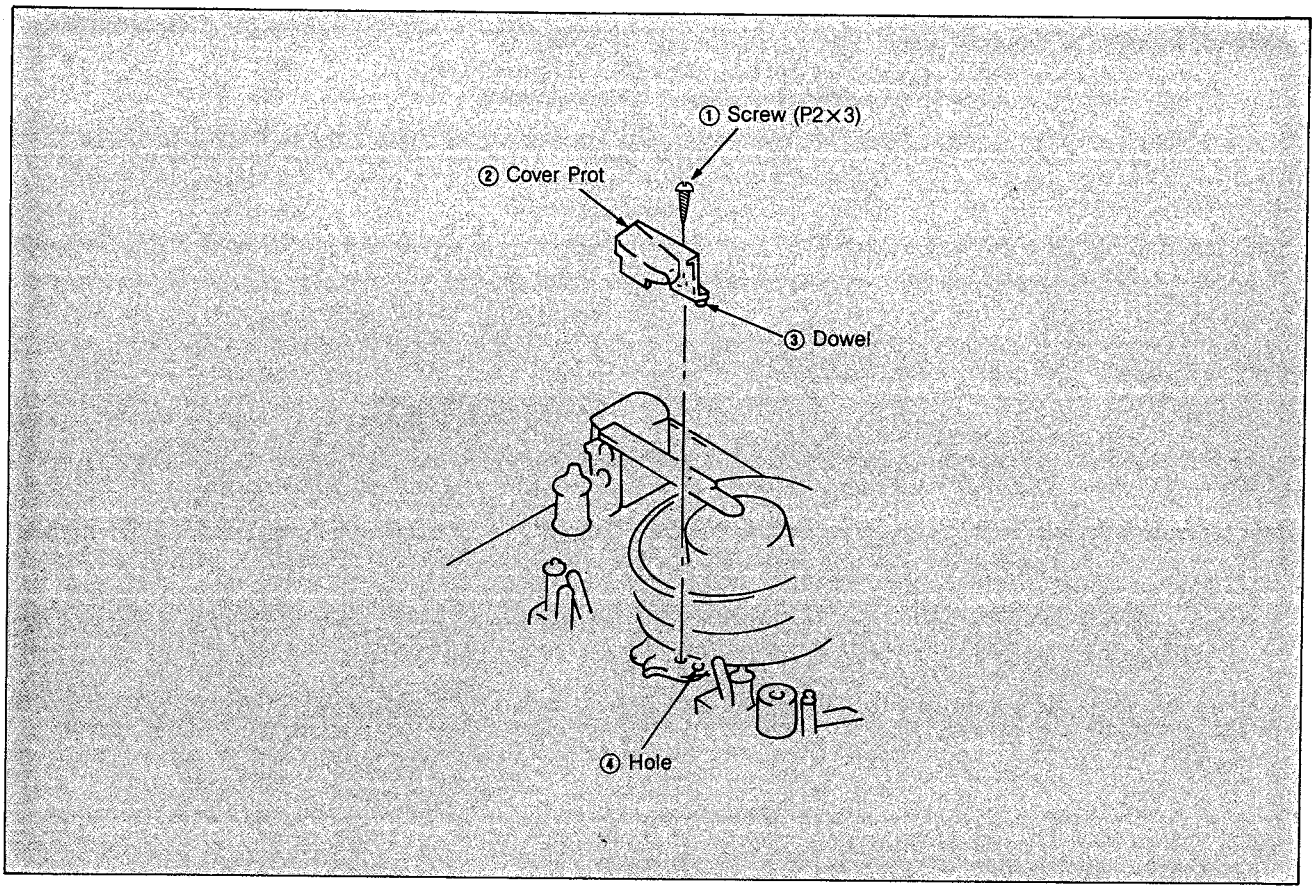

① Screw (P2×3)
② Cover Prot
③ Dowel
④ Hole

Fig. 3-2

3-3. DC MOTOR (CAPSTAN MOTOR) ASSEMBLY

1. Removal (See Fig. 3-3.)

1) Set the ULD mode.
2) Remove the two screws ②, then remove the DC motor ③

2. Installation (See Fig. 3-3.)

1) Align the two screwed dowels ④ with the two holes ⑤, then engage the gear ⑥ with the connecting gear ⑦.
2) Secure the DC motor assembly ③ with the two screws ②.

Note: • When engaging the gears, take care not to damage their teeth.
• Do not leave any clearance between the DC motor ③ and the chassis.
• Do not touch the capstan motor axle*, the oil seal* and the rotor*

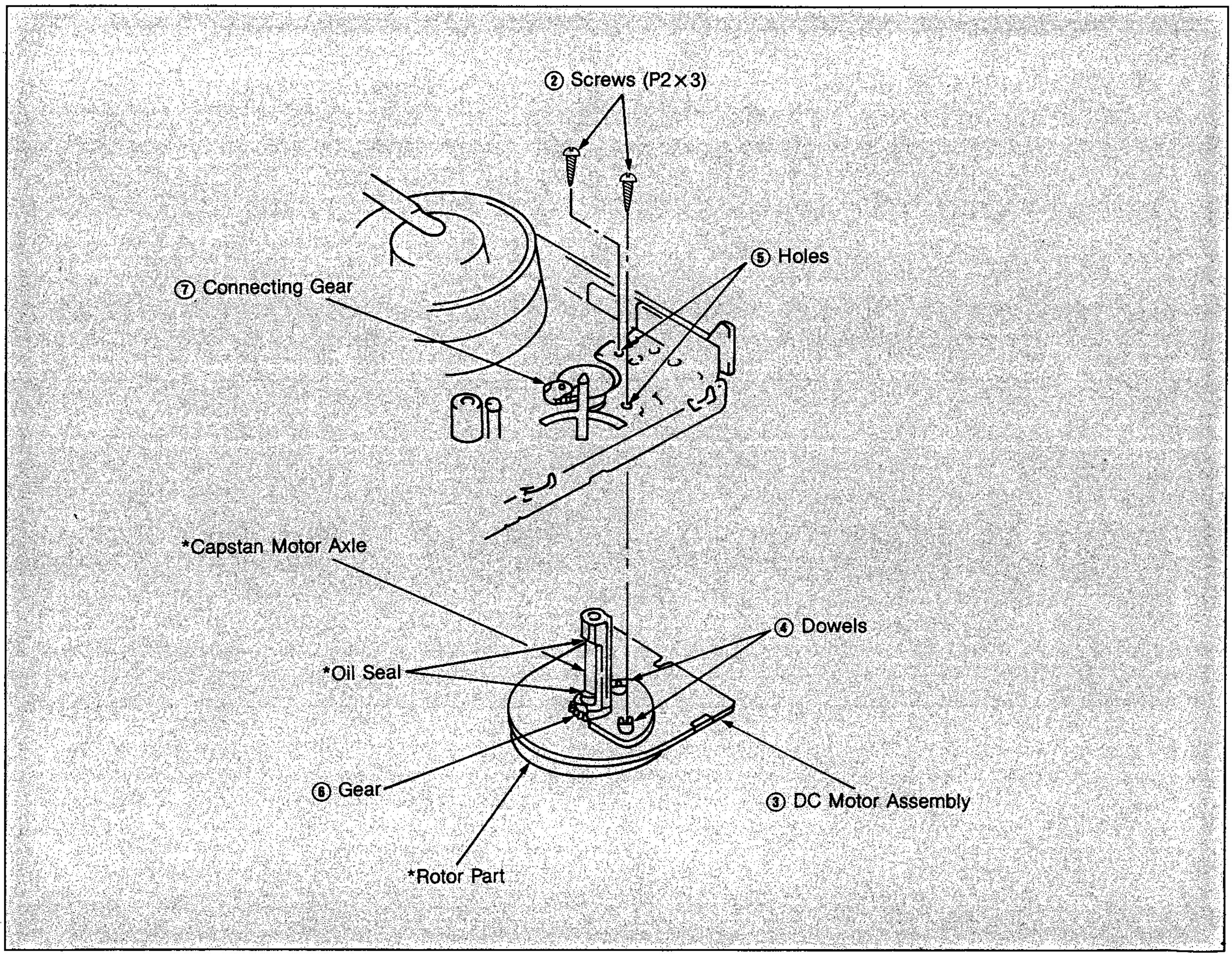

② Screws (P2×3)
⑤ Holes
⑦ Connecting Gear
*Capstan Motor Axle
④ Dowels
*Oil Seal
⑥ Gear
③ DC Motor Assembly
*Rotor Part

Fig. 3-3

3-4. S BRAKE, T BRAKE

1. Removal (See Fig. 3-4.)

1) Remove the torsion coil spring ①.
2) Remove the lever cap ②, then remove the T brake ③.
3) Remove the lever cap ④, then remove the S brake ⑤.

2. Installation (See Fig. 3-4.)

1) While fitting the rack ⑥ into the notch ⑦, mount the S brake ⑤.
2) Insert the lever cap ④.
3) Insert the axle ⑧ to the S reel side of the cam follower ⑨ so that the Ⓐ part comes closer to the drum than part Ⓑ, and mount the T brake ③.
4) Insert the lever cap ②.
5) Insert the torsion coil spring ① below the claw ⑪ of the axle ⑩, then hook it to two claws ⑫.

Note: Confirm that the claws of lever caps ② and ④ are not broken before assembling.

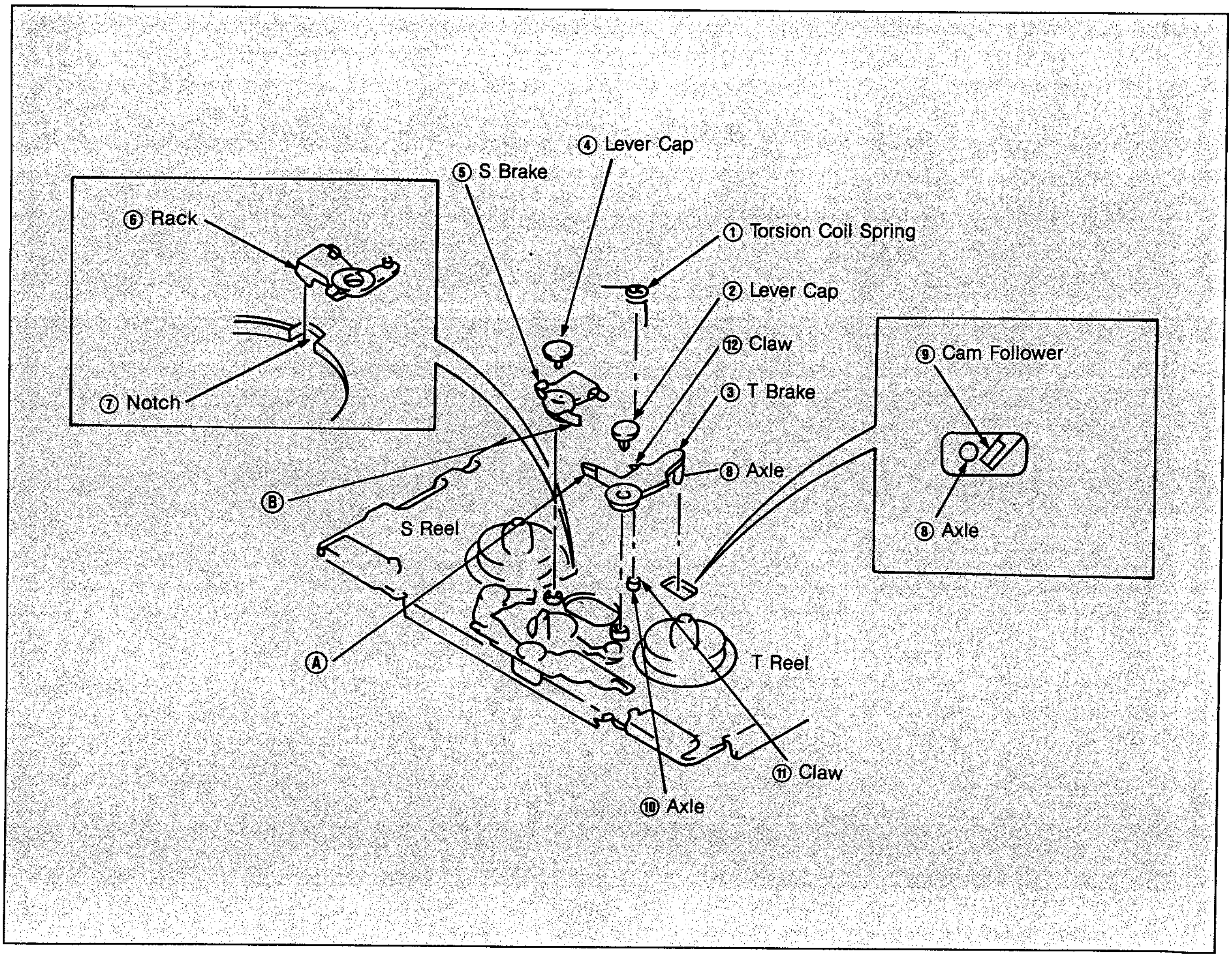

④ Lever Cap
⑤ S Brake
⑥ Rack
⑦ Notch
① Torsion Coil Spring
② Lever Cap
⑫ Claw
③ T Brake
⑧ Axle
⑨ Cam Follower
⑧ Axle
Ⓑ
S Reel
Ⓐ
T Reel
⑪ Claw
⑩ Axle

Fig. 3-4.

3-5. SUB BRAKE, LEVER CAP

1. Removal (See Fig. 3-5.)

1) Remove the screw ①, then remove the TL holding plate ②
2) Remove the lever cap ③, then remove the sub brake ④.
3) Remove the lever cap ⑤, then remove the rifle lever ⑥.

2. Installation (See Fig. 3-5.)

1) Mount the LB lever ⑥ matching it to pin ⑦ of the trans gear, then secure it with the axle holding pin ⑤.
2) Insert the pin ⑧ into the notch ⑨ of the rifle lever ⑥ then mount the sub brake ④ while inserting the rack ⑩ into the notch ⑪.
3) Insert the lever cap ③.
4) Align the dowel ⑫ with the hole ⑬, then mount the cover band and secure it with the screw ①.

Note: Confirm that the claws of lever caps ③ and ⑤ are not broken before assembling.

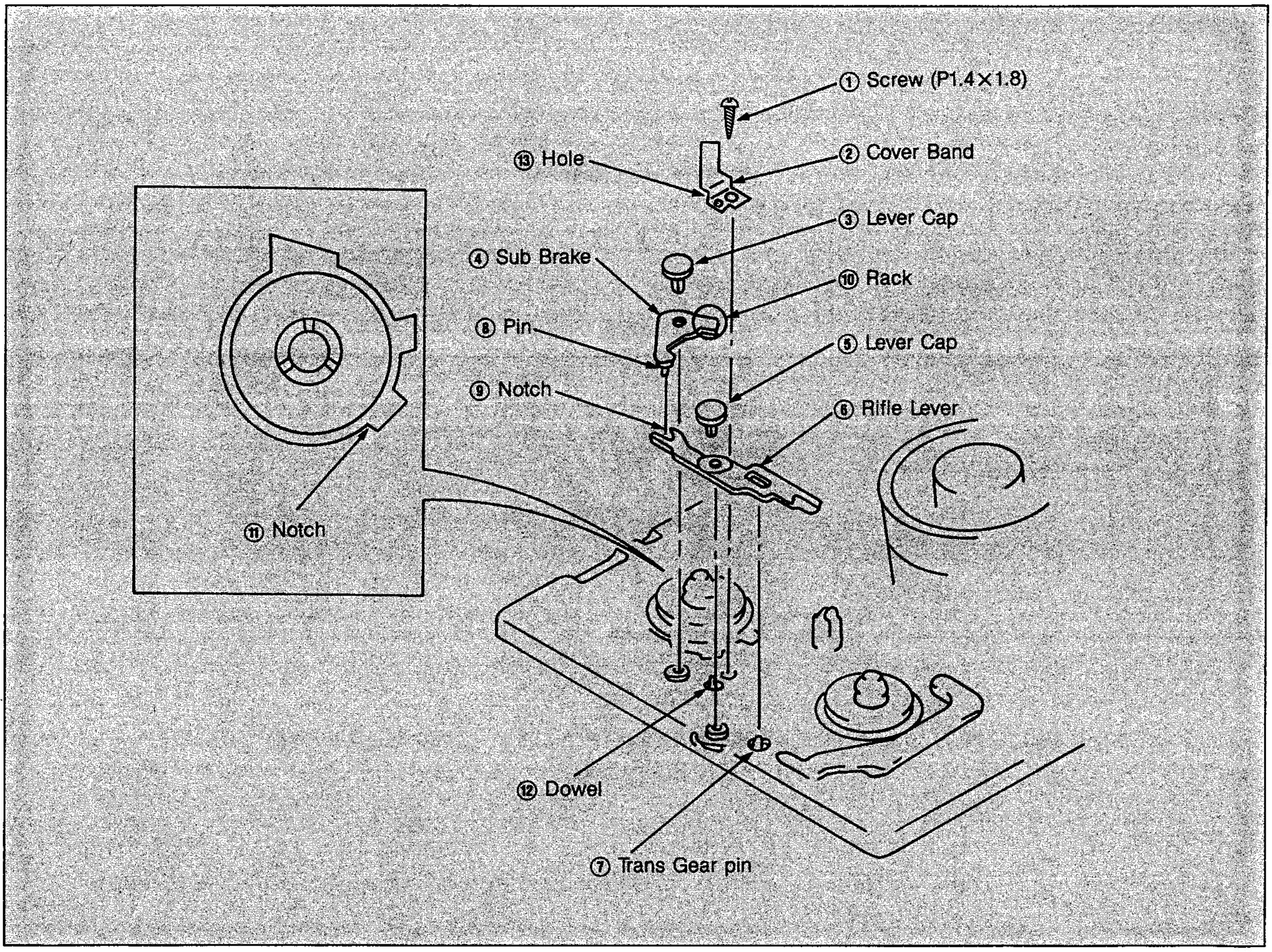

① Screw (P1.4×1.8)
⑬ Hole
② Cover Band
③ Lever Cap
④ Sub Brake
⑩ Rack
⑧ Pin
⑤ Lever Cap
⑨ Notch
⑥ Rifle Lever
⑪ Notch
⑫ Dowel
⑦ Trans Gear pin

Fig. 3-5.

3-6. CONNECT LEVER

1. Removal (See Fig. 3-6.)

1) While pushing the claw ① in the direction of the arrow, remove the connect lever ②.

2. Installation (See Fig. 3-6.)

1) Fit the connect lever ② to the axle ③, insert protrusions ⓐ, ⓑ, ⓒ, ⓓ into the three holes ④, then secure with the claw ①.

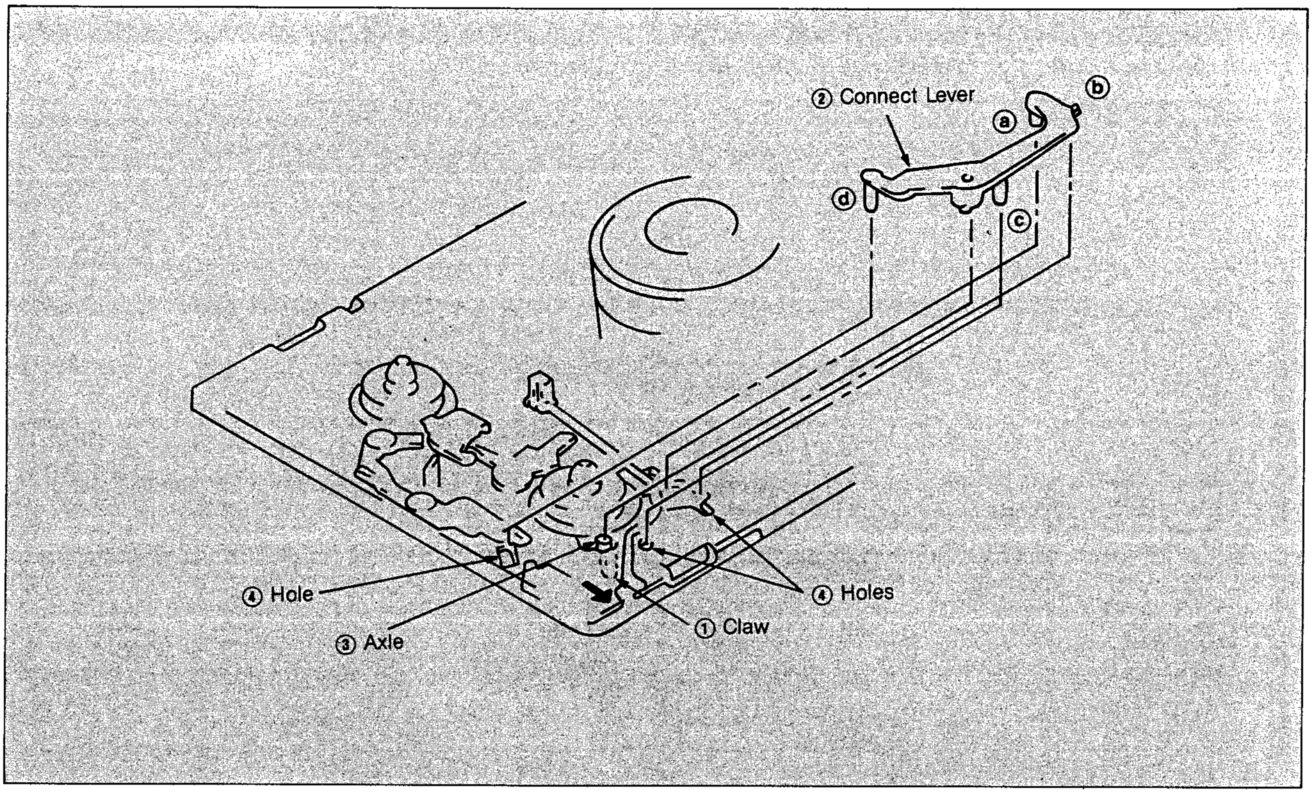

② Connect Lever
ⓑ
ⓐ
ⓓ
ⓒ
④ Hole
③ Axle
① Claw
④ Holes

Fig. 3-6

3-7. LOCK LEVER, ADJUST LEVER

1. Removal (See Fig. 3-7.)

1) Remove the torsion spring ①.
2) Open the chassis claw ②, then remove the adjust lever ③.
3) Remove the lock lever.

2. Installation (See Fig. 3-7.)

1) Mount the lock lever ④ onto the axle ⑤.
2) Mount the adjust lever ③ onto the axle ⑥, insert pin ⑩ into hole ⑪, then hook the claw ② of the chassis to the hole ⑦.
3) Insert the torsion spring ① into the axle ⑤, then hook it to claws ⑧ and ⑨

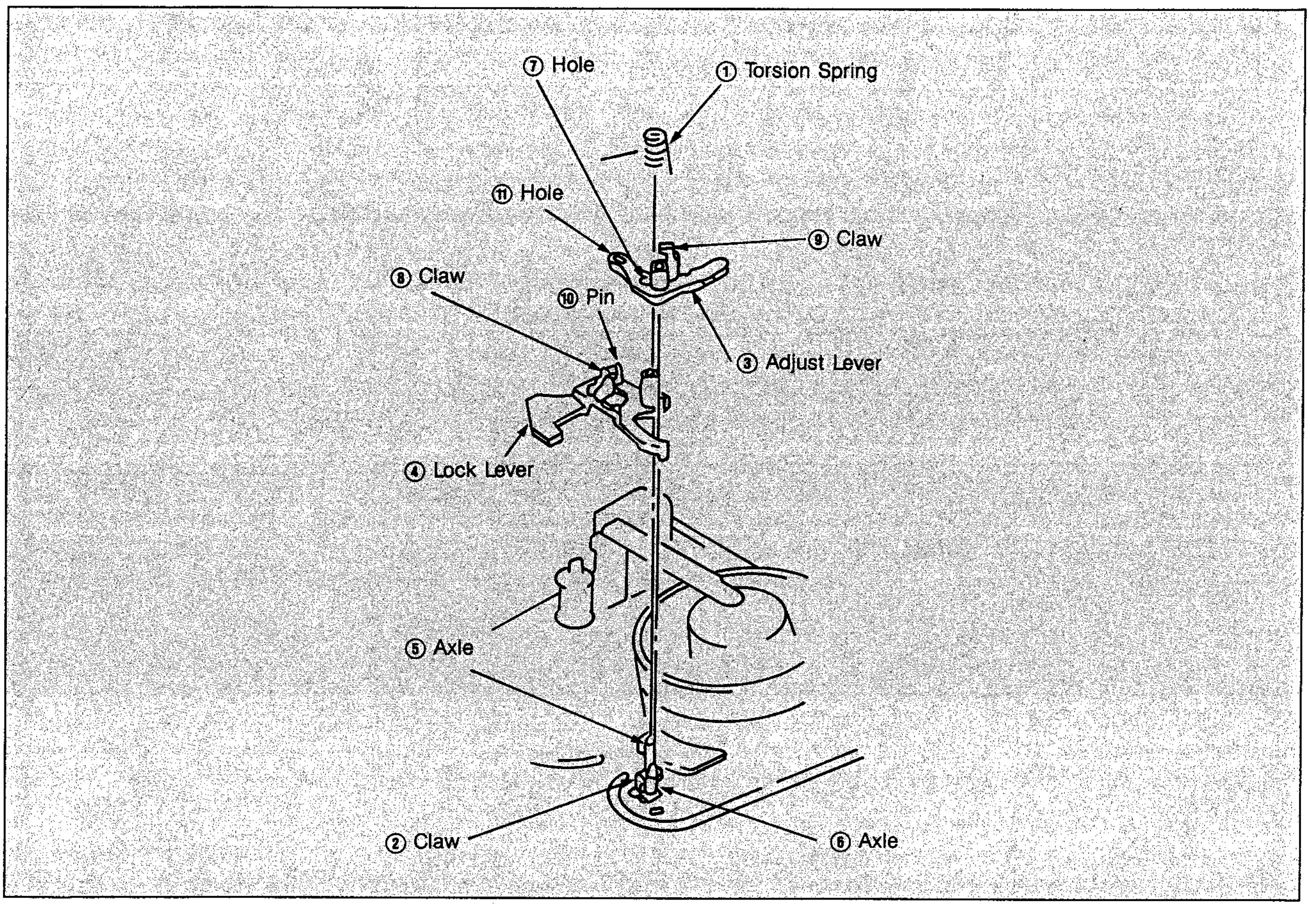

⑦ Hole
① Torsion Spring
⑪ Hole
⑨ Claw
⑧ Claw
⑩ Pin
③ Adjust Lever
④ Lock Lever
⑤ Axle
② Claw
⑥ Axle

Fig. 3-7.

3-8. PINCH ARM ASSEMBLY, GUIDE ARM ASSEMBLY

1. Removal (See Fig. 3-8.)

1) Set the IB mode.
2) Remove the stopper washer ①, then remove the pinch arm assembly ②.
3) Bend the claw ④ inside hole ③ in the direction of the arrow using a thin screwdriver or the like, then remoe the stopper GA ⑤.
4) Remove the guide arm assembly ⑥.

2. Installation (See Fig. 3-8.)

1) Grease the inner surfaces of hole ⑦ (See Fig. A).
2) Insert the axle ⑧ of the guide arm assembly ⑥ into the hole ⑦.
3) Grease the shaded section ⓐ(See Fig. A).
4) Insert the stopper GA ⑤ into the hole ③, then secure it with the claw ④.
5) Apply half a drop of oil to the axle ⑨ (See Fig. B).
6) Fit the pinch arm assembly ② to the axle ⑨ and insert the pinch lock assembly tab ⑩ into the ⓑpart.
7) Install the stopper washer ①.

Note:
- Take care not to grease the screw ⑪ of the guide arm assembly ⑥ (See Fig. A.)
- When fitting the pinch arm assembly ② to the axle ⑨, make sure that it does not touch the TG-7 guide ⑫ or the rubber roller ⑬.
- After assembling, be sure to perform tape path adjustment as described in section 4.

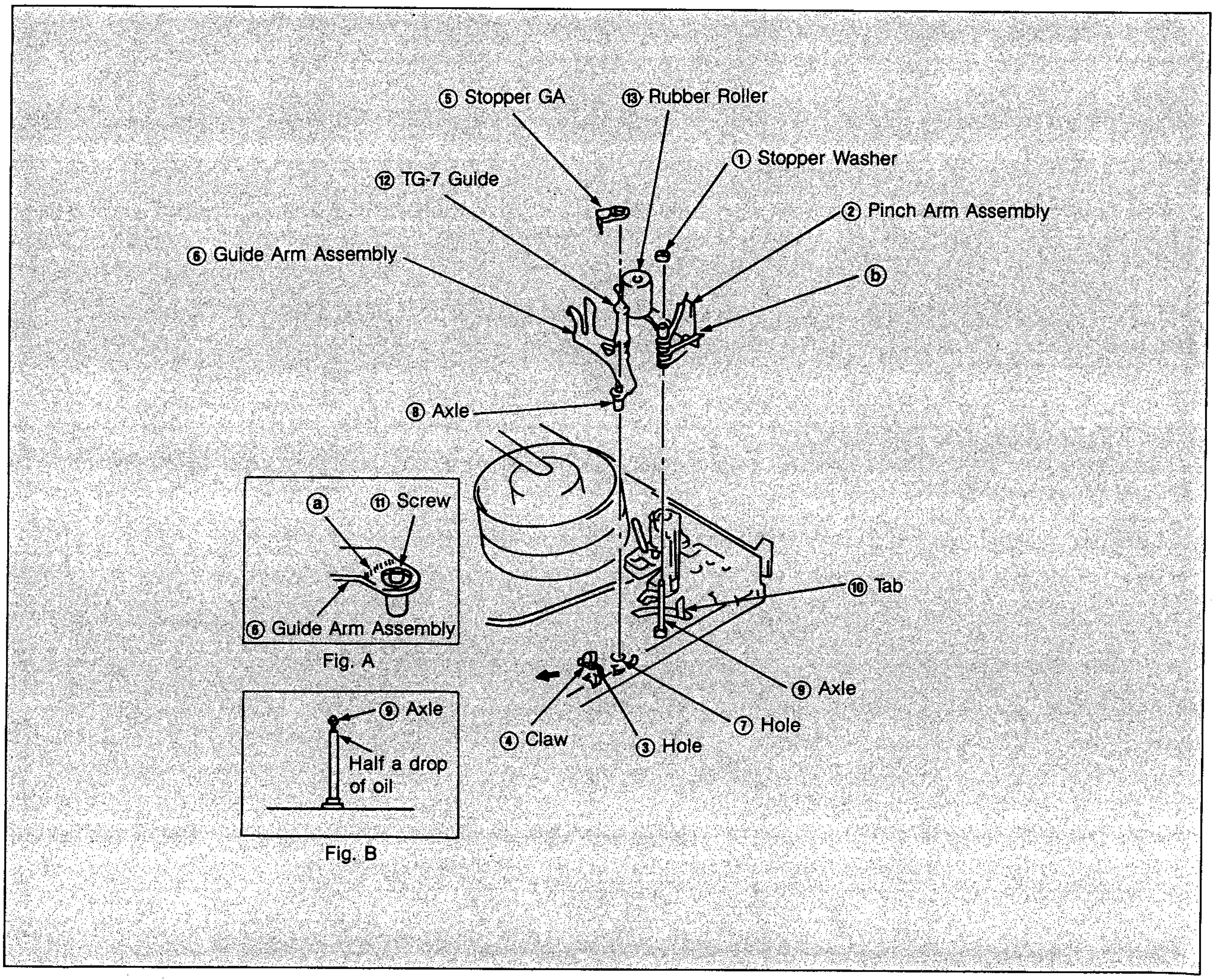

⑤ Stopper GA
⑬ Rubber Roller
① Stopper Washer
⑫ TG-7 Guide
② Pinch Arm Assembly
⑥ Guide Arm Assembly
ⓑ
⑧ Axle
ⓐ
⑪ Screw
⑥ Guide Arm Assembly
Fig. A
⑩ Tab
⑨ Axle
⑦ Hole
④ Claw
③ Hole
⑨ Axle
Half a drop of oil
Fig. B

Fig. 3-8.

3-9. TG-2 ASSEMBLY

1. Remove (See Fig. 3-9.)

1) Remove the impedance cap ①.
2) Remove the impedance roller ②, the impedance bush ③, limit washer ④ and the compression spring ⑤.

2. Installation (See Fig. 3-9.)

1) Mount the compression spring ⑤, the limit washer ④, impedance bush ③ and the roller ② to the axle.
2) Secure the impedance cap ① to the axle by rotating it 4 to 6 turns.

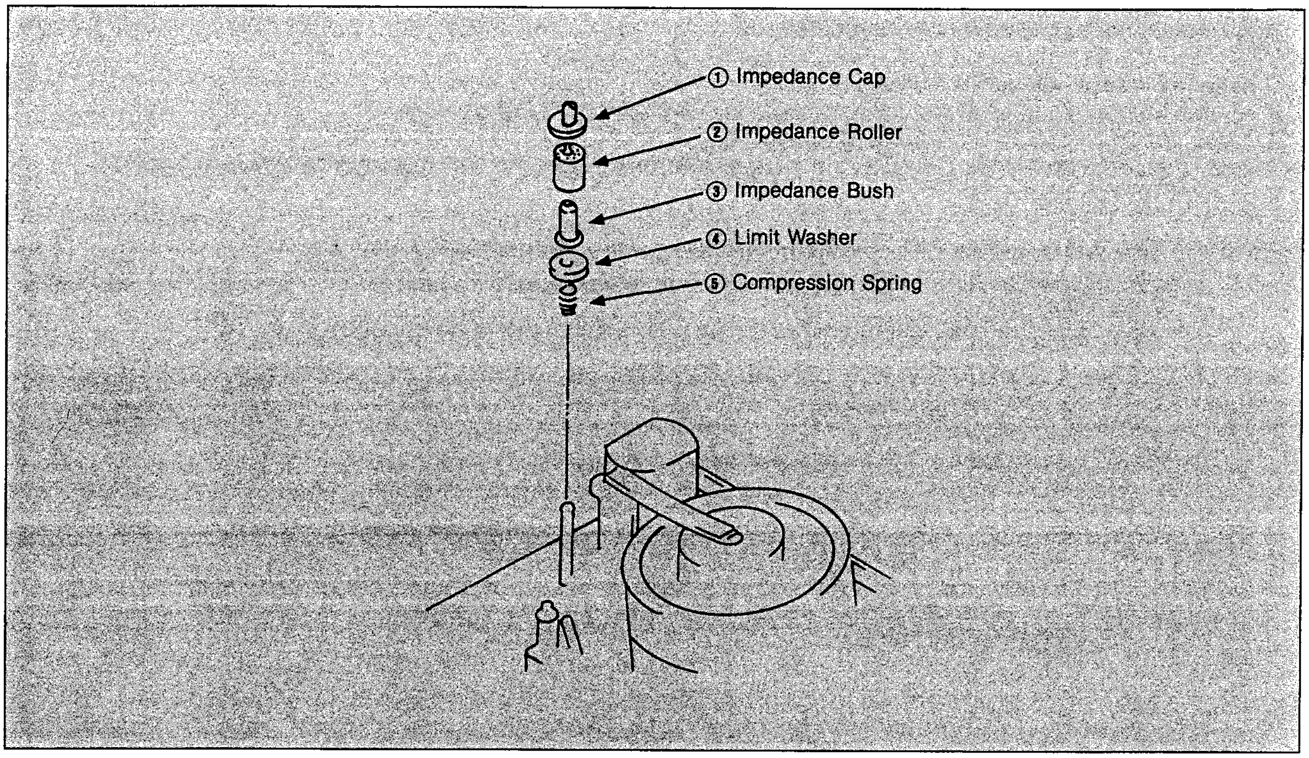

① Impedance Cap
② Impedance Roller
③ Impedance Bush
④ Limit Washer
⑤ Compression Spring

Fig. 3-9.

3. TG-2 Height Preset (See Fig. 3-10.)

1) Adjust height from the mechanism chassis upper surface to the impedance cap ① upper surface to 18.6mm by turning the impedance cap ①.

Note: After adjustment, be sure to perform tape path adjustment as described in section 4.

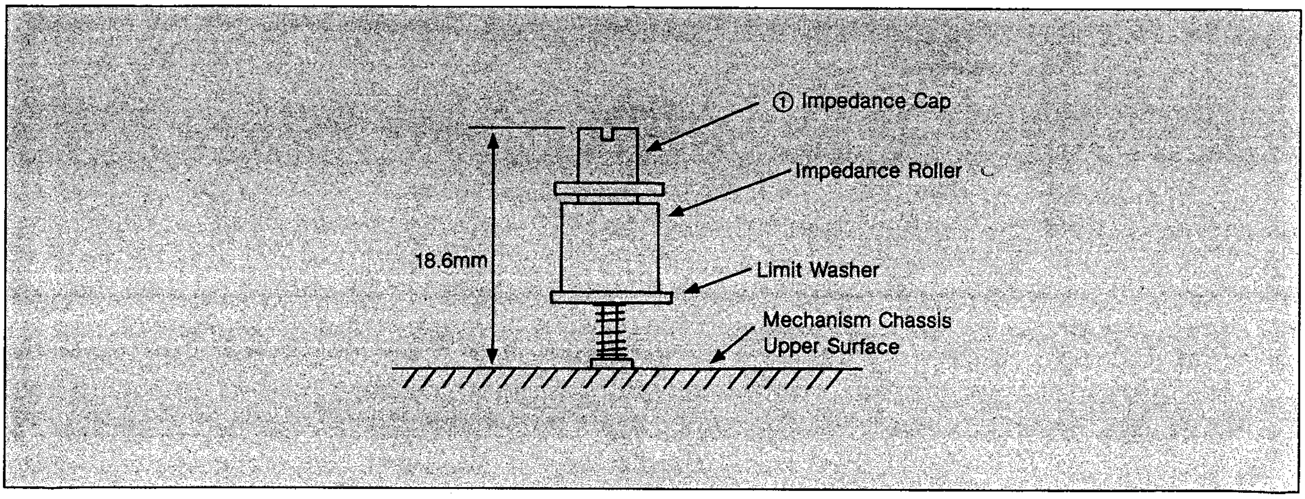

① Impedance Cap
Impedance Roller
18.6mm
Limit Washer
Mechanism Chassis Upper Surface

Fig. 3-10.

3-10. S REEL TABLE ASSEMBLY. T REEL TABLE ASSEMBLY

1. Removal (See Fig. 3-11.)

1) Remove the S brake and T brake as described in section 3-4.
2) Remove the cover band as described in section 3-5.
3) Remove the band brake assembly as described in section 3-11.
4).Remove the S reel table assembly ①.
5) Turn the stopper ② approx. 90° in the direction of the arrow Ⓐ.
6) While sliding the connect lever ③ in the direction of the arrow Ⓑ, remove the T reel table assembly ④.

2. Installation (See Fig. 3-11.)

1) Apply half a drop of oil to the axle ⑤ (See Fig. A).
2) Move the idler gear ⑥ in the direction of the arrow Ⓒ and the Soft brake ⑦ in the direction of the arrow Ⓓ putting them out of the way.
3) While sliding the connect lever ③ in the direction of the arrow Ⓑ, mount the T reel table assembly ④ onto the axle ⑤, then turn the stopper ② in the direction of the arrow Ⓔ as far as it will go.
4) Apply half a drop of oil to the axle ⑧ (See Fig. B).
5) Move the idler gear ⑥ in the direction of the arrow Ⓕ, the UL brake ⑨ in the direction of the arrow Ⓖ and the sub brake ⑩ in the direction of the arrow Ⓗ, putting them out of they way.
6) Mount the S reel table ① onto the axle ⑧.
7) Mount the band brake assembly as described in section 3-11.
8) Mount the cover band as describeds in section 3-5.
9) Mount the S brake and T brake assemblies as described in section 3-4.

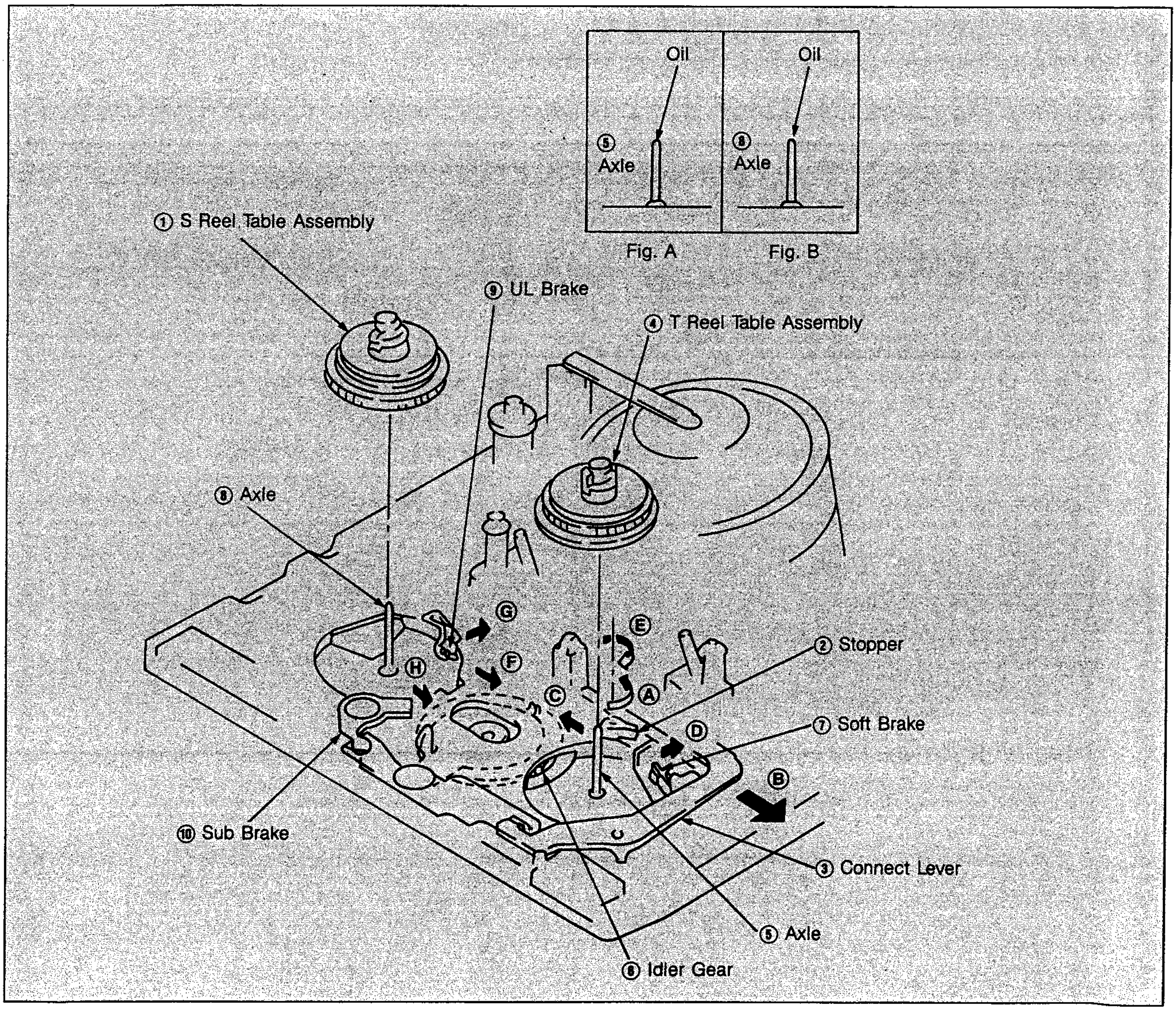

Oil
⑤ Axle
Fig. A
Oil
⑧ Axle
Fig. B
① S Reel Table Assembly
⑨ UL Brake
④ T Reel Table Assembly
⑧ Axle
Ⓖ
Ⓔ
Ⓗ
Ⓕ
Ⓒ
Ⓐ
Ⓓ
Ⓑ
② Stopper
⑦ Soft Brake
⑩ Sub Brake
③ Connect Lever
⑤ Axle
⑥ Idler Gear

Fig. 3-11.

3-11. BAND BRAKE ASSEMBLY, TENSION ARM ASSEMBLY

1. Removal (See Fig. 3-12.)

1) Remove the cover band as described in section 3-5.
2) Remove the screw ①.
3) Using a thin screwdriver or the like, remove the band brake assembly ④ from the axle ③ of tension arm assembly ②.
4) Remove the tension spring ⑤.
5) Remove the stopper washer ⑥ from the back of the mechanism chassis, then remove the tension arm assembly ②.
6) Open the claw ⑦, then remove the adjust arm ⑧.

Note: When removing the band brake assembly ④, take care not to twist or bend it, and not to touch the felt surface ⑨.

2. Installation (See Fig. 3-12.)

1) Engage the adjust arm ⑧ in the position shown in Fig. A, then close the claw ⑦.
2) Apply half a drop of oil to the hole ⑩.
3) Mount the tension arm assembly ②, then insert it into the slot ⑪ so that the ⓐpart comes to the arrow Ⓐside of the mode lever assembly (See Fig. B).
4) While holding the tension arm assembly ② from the mechanism chassis front, secure it with the stopper washer ⑥ from the back.
5) Hook the R hook of the tension spring ⑥ to the adjust arm ⑧ as shown in the figure, then hook the opposite end to the tension arm assembly ②.
6) Mount the band brake assembly ④ onto the axle ③ of tension arm assembly ②, and place it so that the felt surface ⑨ comes against the shaded portion of the S reel table assembly ⑫.
7) Mount the band bracket ⑬ of the band brake assembly ④ so that it is aligned with the dowel ⑭ of the mechanism chassis, then secure it temporarily with the screw ①.
8) Mount the cover band as described in section 3-5.
9) Adjust tension regulator FWD position as described in section 3-12.
10) Perform adjust arm adjustment as described in section 3-22.

Note: When mounting the band brake assembly ②, take care not to twist or bend it, and not to touch the felt surface ⑨.

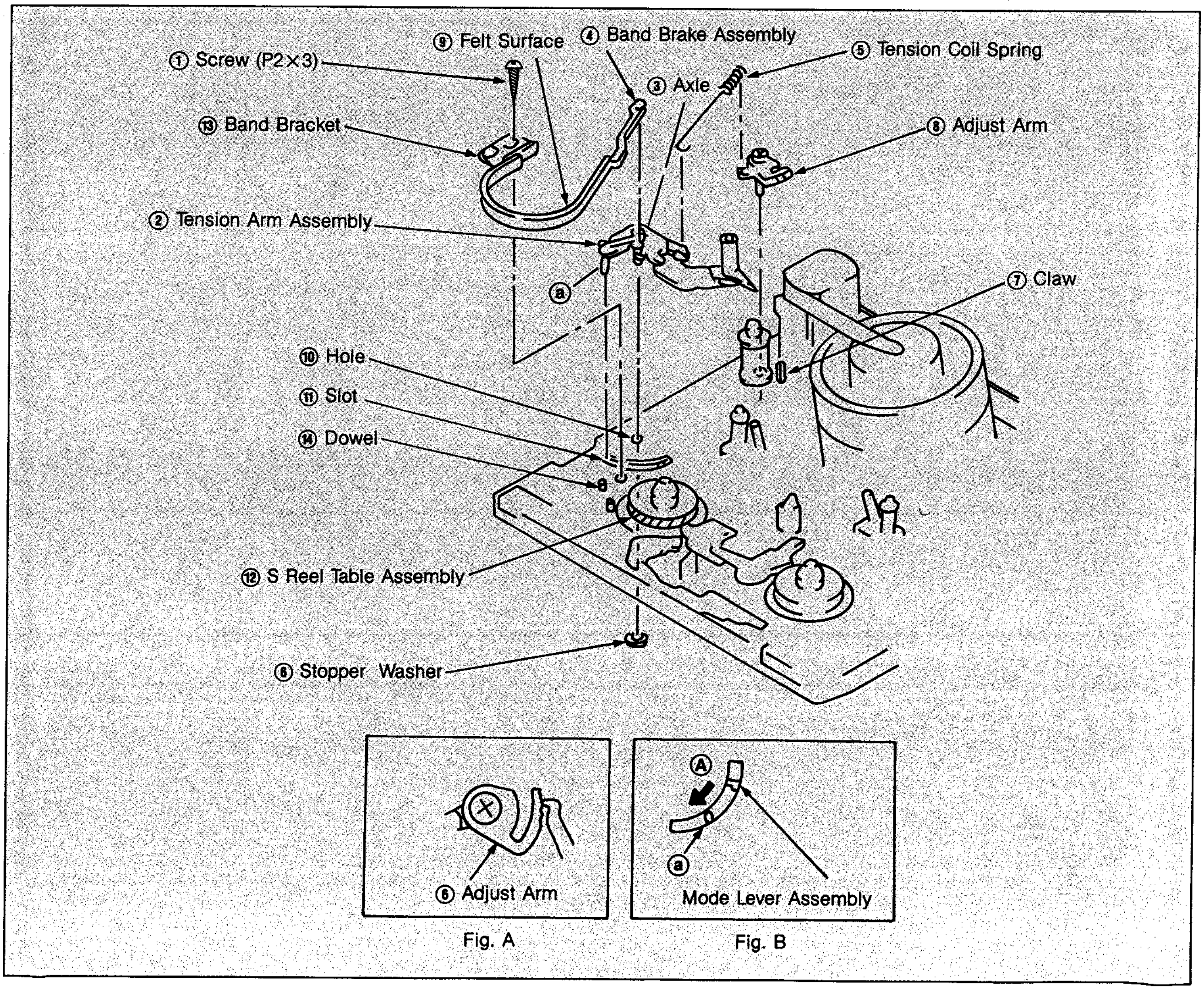

① Screw (P2×3)
⑨ Felt Surface
④ Band Brake Assembly
③ Axle
⑤ Tension Coil Spring
⑬ Band Bracket
⑧ Adjust Arm
② Tension Arm Assembly
ⓐ
⑦ Claw
⑩ Hole
⑪ Slot
⑭ Dowel
⑫ S Reel Table Assembly
⑥ Stopper Washer
⑥ Adjust Arm
Ⓐ
ⓐ
Mode Lever Assembly

Fig. A

Fig. B

Fig. 3-12.

3-12. TENSION REGULATOR FWD POSITION PRESET (See Fig. 3-13).

1) Load a cassette tape and set the FWD mode.
2) Confirm whether the distance between ⓐ part of the tension arm ① and the groove ② of the chassis is 1.1±0.3 mm. If this distance is not within the specified range, remove the cassette tape and perform the following adjustment.
3) Loosen the fixing screw ④ of the band brake assembly ③.
4) Slide the band bracket ⑤ in the direction of the arrow Ⓐ if the measured distance is over the specified range, and in the direction of the arrow Ⓑ if it is under that range. Then, fix it with the screw ④.
5) Repeat steps 1) and 2) and confirm that the distance is within the specified range.

Note: Use a cassette with the tape advanced halfway.

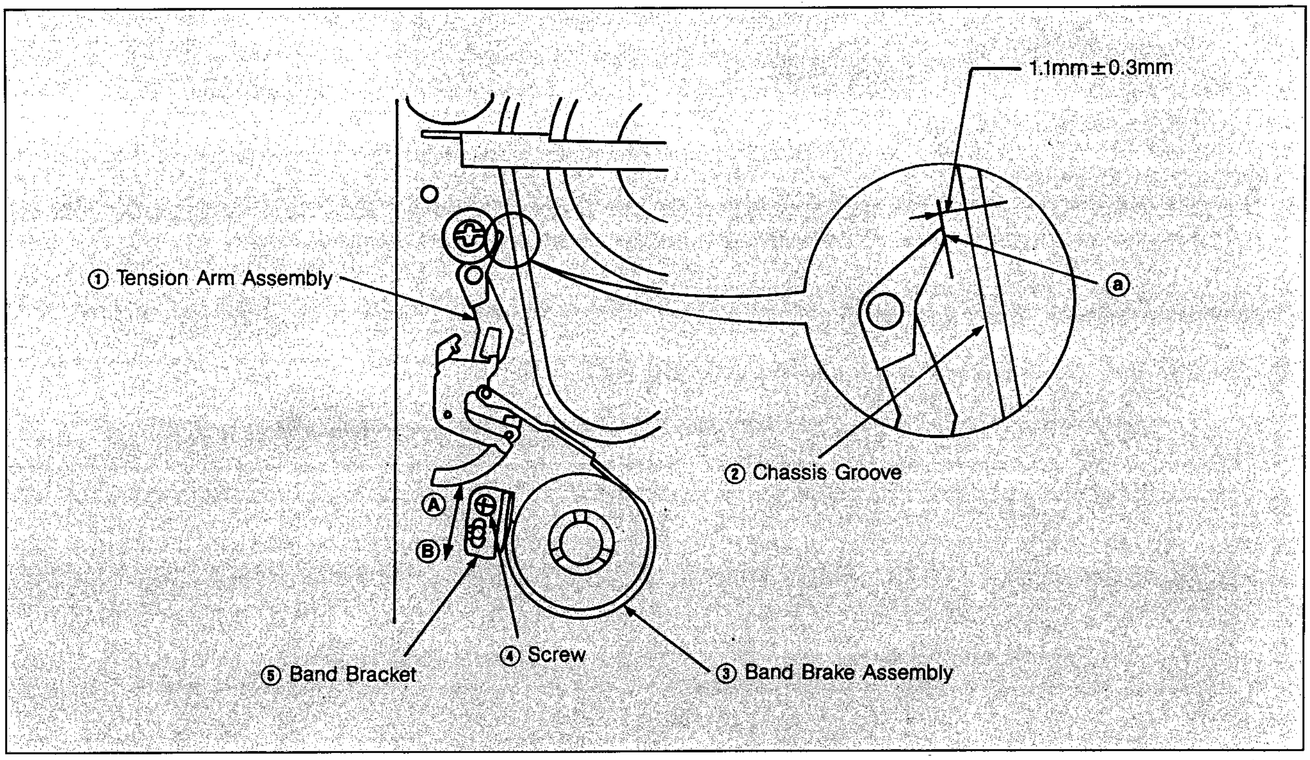

1.1mm±0.3mm
① Tension Arm Assembly
ⓐ
② Chassis Groove
Ⓐ
Ⓑ
④ Screw
⑤ Band Bracket
③ Band Brake Assembly

Fig. 3-13.

3-13. DRUM ASSEMBLY, DEW SENSOR

1. Removal (See Fig. 3-14.)

1) Set the EJECT mode.
2) Remoe two card edge connectors ① and ②.
3) Remove the protect cover as described in section 3-2.
4) Remove the screw ③, then remove the earth plate ④.
5) Remove the three screws ⑤, then remove the drum assembly ⑥ from the mechanism chassis.
6) Remove the connector ⑩.
7) Remove the screw ⑦, then remove the dew sensor ⑧.

Note:
- When removing the drum assembly ⑥ from the mechanism chassis, take care not to cut the flexible board or the harness ⑮
- Take care not to touch the head tip ⑨.

2. Installation (See Fig. 3-14.)

1) Insert part ⓐ of the dew sensor ⑧ into the notch ⑪ of the mechanism chassis, then secure it with the screw ⑦.
2) Mount the conector ⑩.
3) Clamp the harness ⑮ of the dew sensor ⑧ with the reinforcing the claw ⑯ of the S loading cover (See Fig. A).
4) Align the drum assembly ⑥ with the two dowels ⑬ and secure it with the three screws ⑤.
5) Align the earth plate ④ with the two dowels ⑭ of the mechanism chassis and secure it with the screw ③.
6) Mount the protect cover as described in section 3-2.
7) Mount the two card edge connectors ① and ②.

Note:
- Take care not to cut rhe flexible board or the harness ⑮.
- Take care not to touch the head tip ⑨.
- After assembling, be sure to perform Tape Path Adjustment following instructions in section 4.

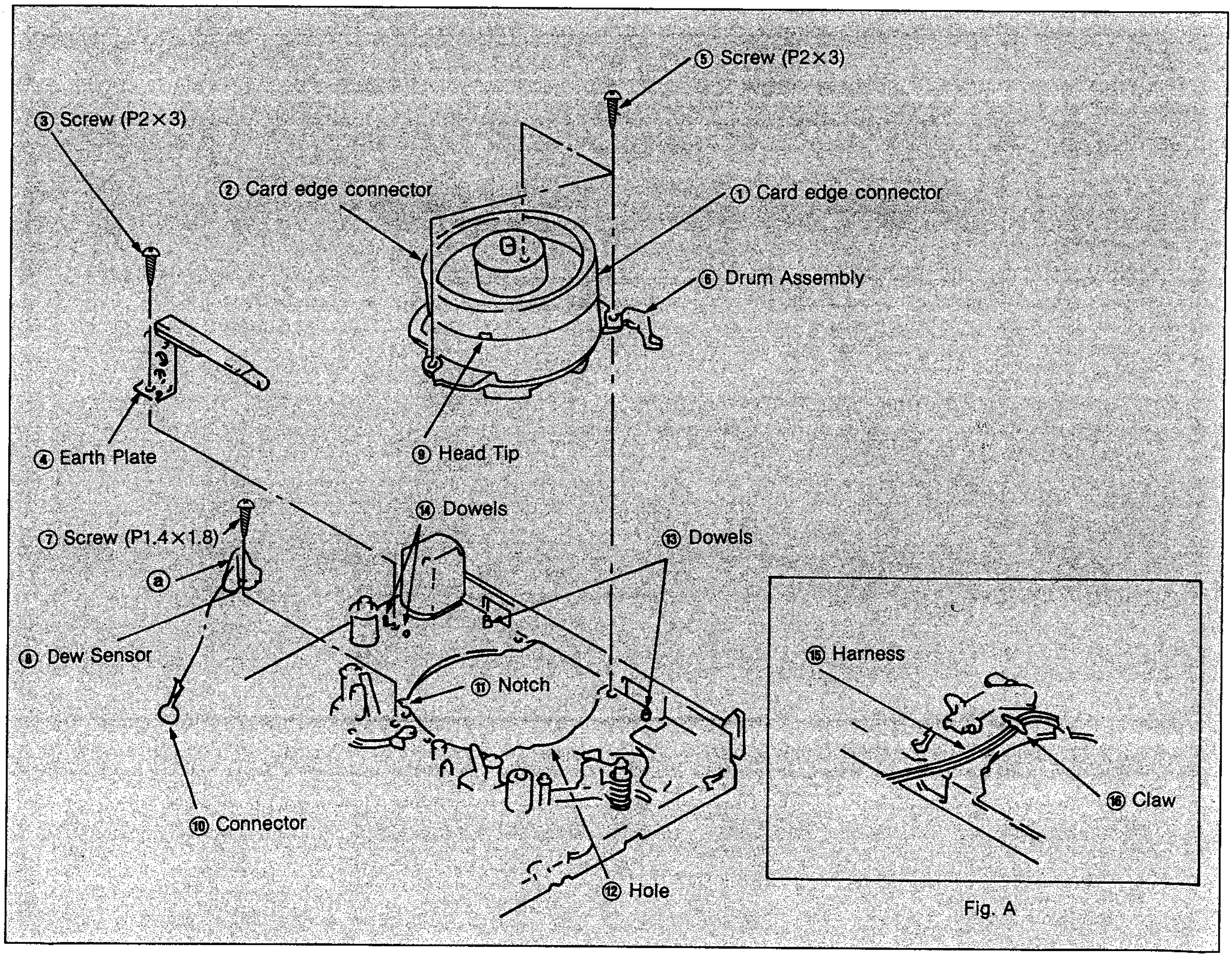

⑤ Screw (P2×3)
③ Screw (P2×3)
② Card edge connector
① Card edge connector
⑥ Drum Assembly
④ Earth Plate
⑨ Head Tip
⑭ Dowels
⑦ Screw (P1.4×1.8)
⑬ Dowels
ⓐ
⑧ Dew Sensor
⑪ Notch
⑩ Connector
⑫ Hole
⑮ Harness
⑯ Claw
Fig. A

Fig. 3-14.

3-14. EJECT LEVER, MODE LEVER ASSEMBLY, PINCH LOCK ASSEMBLY

1. Removal (See Fig. 3-15).

1) Remove the DC motor (capstan motor) as described in section 3-3.
2) Set the STOP mode.
3) Remove the claw ①, then remove the eject lever ②.
4) Remove the stopper washer ③, then remove the mode lever assembly ④.
5) Remove the pinch lock spring ⑤.
6) Remove the stopper washer ⑥, then remove the pinch lock assembly ⑦.

2. Installation (See Fig. 3-15.)

1) Grease the axle ⑧ (See Fig. A.)
2) Assembly by inserting ⓐ part of the pinch lock assembly ⑦ into the slot ⑨, then insert the pin ⑩ into the mode plate assembly notch ⑪.
3) Secure with the stopper washer ⑥.
4) Mount the pinch lock spring ⑤ by catching its ⓑ end between the claw ⑫ and the chassis side and its ⓒ end to the claw ⑫.
5) Apply half a drop of oil to the axle ⑬ (See Fig. B)
6) Align the groove ⑭ of the mode lever assembly ④ with the mode switch protrusion ⑮, mount it on the axle ⑬, then insert the pin ⑯ into the cam A ⑰ outer groove.
7) Secure with the stopper washer ③.
8) Mount the eject lever ② and close the claw ①.
9) Mount the DC motor (capstan motor) as described in section 3-3.

Note: When mounting the mode lever assembly ④ onto the axle ⑬ with the tension arm assembly installed, set the pin ⑱ to the arrow Ⓐ side of the mode lever assembly ④.

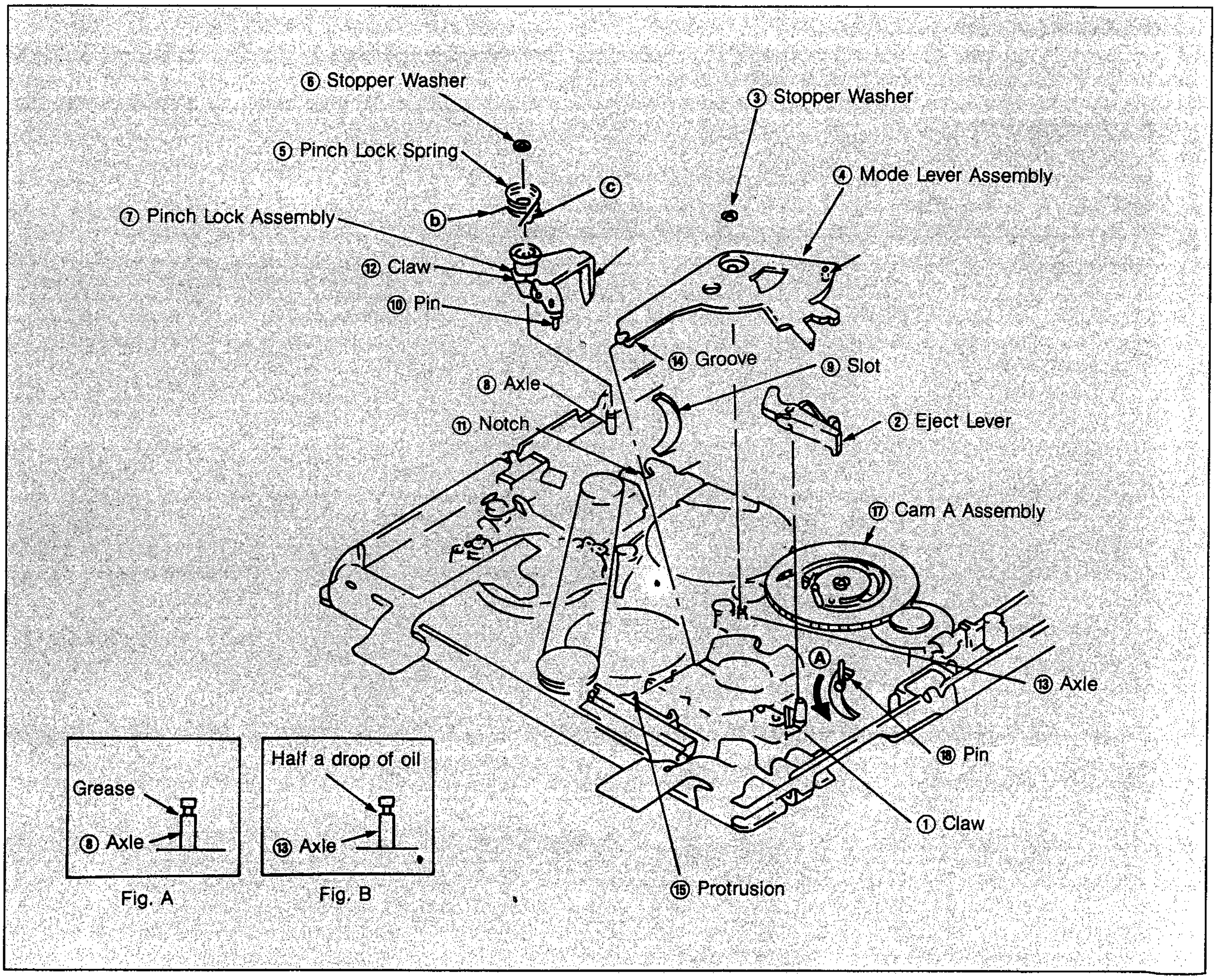

⑥ Stopper Washer
③ Stopper Washer
⑤ Pinch Lock Spring
④ Mode Lever Assembly
ⓒ
⑦ Pinch Lock Assembly
ⓑ
⑫ Claw
⑩ Pin
⑭ Groove
⑨ Slot
⑧ Axle
⑪ Notch
② Eject Lever
⑰ Cam A Assembly
Ⓐ
⑬ Axle
⑱ Pin
① Claw
⑮ Protrusion
Grease
⑧ Axle
Half a drop of oil
⑬ Axle

Fig. A

Fig. B

Fig. 3-15.

3-15. TIMING BELT B, REEL GEAR ASSEMBLY, MODE PLATE ASSEMBLY, TIMING BELT A, GEAR A ASSEMBLY

1. Removal (See Fig. 3-16.)

1) Remove the DC motor (capstan motor) as described in section 3-3.
2) Remove the pinch lock assembly as described in section 3-14.
3) Set the STOP mode.
4) Remove the stopper washer ①, then remove the Reel gear assembly ② from the axle ④ with the timing belt B ③ attached.
5) Remove the timing belt A ③ from the Gear B assembly ⑤.
6) Remove the stopper washer ⑥ and remove the mode plate assembly ⑧ while pushing the claw ⑦ in the direction of the arrow Ⓐ.
7) Turn the stopper ⑨ approx. 90° in the direction of the arrow Ⓑ.
8) Remove the gear A assembly ⑪ from the axle ⑯ with the timing belt A ⑩ attached.
9) Remove the timing belt A ⑩ from the gear B assembly ⑤.

Note: When removing the gear A ⑪, take care not touch the flange section ⓑ.

2. Installation (See Fig. 3-16).

1) Apply half a drop of oil to the axle ⑯ (See Fig. F.)
2) Hook one end of the timing belt A ⑩ onto the gear A assembly ⑪ and the other end onto gear ⓓ of the gear B assembly ⑤. (Refer to the figure).
3) Mount the gear A assembly ⑪ with the timing belt A ⑩ attached to the axle ⑯.
4) Turn the stopper ⑨ in the direction of the arrow Ⓒ as far as it will go.
5) Apply half a drop of oil to the axle ⑫ (See Fig. A).
6) Fit the mode plate assembly ⑧ to the axle ⑫, secure the ⓐ part with the claw ⑦ and place the pin ⑬ into the groove of the cam B assembly ⑭.
7) Install the stopper washer ⑥.
8) Place the timing blet B ③ around the gears of the reel gear assembly ② indicated in Fig. B. and its opposite side around the gear ⓒ of the gear B assembly ⑤. (See Fig. E.)
9) Mount the reel gear assembly ② onto the axle ④ with the timing belt B ③ attached, and engage it with the gear of the idler assembly ⑮.
10) Install the stopper washer ①.
11) Grease parts of the mode plate assembly ⑧ indicated in Fig. C.
12) Mount the pinch lock assembly as described in section 3-14.
13) Mount the DC motor (capstan motor) as described in section 3-3.

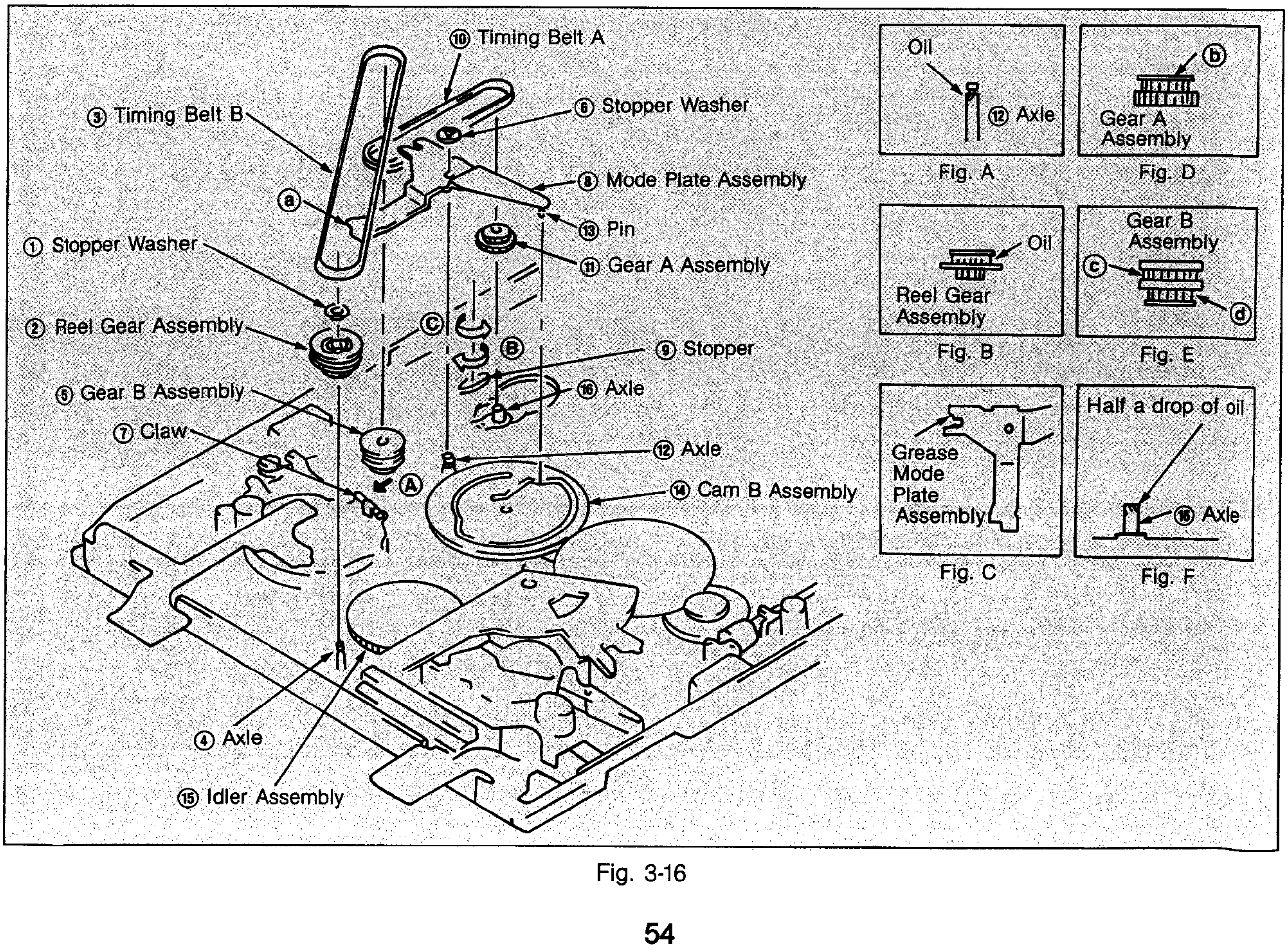

⑩ Timing Belt A
③ Timing Belt B
⑥ Stopper Washer
⑧ Mode Plate Assembly
ⓐ
⑬ Pin
① Stopper Washer
⑪ Gear A Assembly
② Reel Gear Assembly
Ⓒ
Ⓑ
⑨ Stopper
⑤ Gear B Assembly
⑯ Axle
⑦ Claw
⑫ Axle
Ⓐ
⑭ Cam B Assembly
④ Axle
⑮ Idler Assembly
Oil
⑫ Axle
Fig. A
ⓑ
Gear A Assembly
Fig. D
Oil
Reel Gear Assembly
Fig. B
Gear B Assembly
ⓒ
ⓓ
Fig. E
Grease
Mode Plate Assembly
Fig. C
Half a drop of oil
⑯ Axle
Fig. F

Fig. 3-16

3-16. GEAR B, SOFT BRAKE ASSEMBLY, TRANSFER ASSEMBLY, IDLER ASSEMBLY

1. Removal (See Fig. 3-17.)

1) Remove the DC motor (capstan motor) as described in section 3-3.
2) Remove the mode lever assembly as described in section 3-14.
3) Remove the timing belt B, the reel gear assembly, the mode plate assembly, the timing belt A and the gear A assembly described in section 3-15.
4) Set the STOP mode.
5) Remove the stopper washer ①, then remove the gear B ②.
6) Open the claw ③, then remove the soft brake assembly ④.
7) Remove the torsion spring ⑤.
8) Remove the stopper washer ⑥, then remove the transfer assembly ⑦.
9) Remove the idler assembly ⑧.

Note: When removing the gear B ②, take care not to touch the flange section ⓐ. (See Fig. C.)

2. Installation (See Fig. 3-17.)

1) Apply half a drop of oil to the axle ⑨ (See Fig. A).
2) Mount the idler assembly ⑧ onto the axle ⑨, keeping it in horizontal positon.
3) Apply half a drop of oil to the axle ⑩ (See Fig. B).
4) Mount the transfer assembly ⑦ onto the axle ⑩ and secure it with the stopper washer ⑥.
5) Insert the torsion spring ⑤ into the axle ⑪ then hook it to the mechanism chassis notch ⑫ and to the tab ⑬.
6) Mount the soft brake assembly ④ and close the claw ③.
7) Apply half a drop of oil to the axle ⑯ (See Fig. D).
8) Mount the gear B ② onto the axle ⑯, then secure it with the stopper washer ①.
9) Mount the timing belt B, the real gear assembly, the mode plate assembly, the timing belt A and the gear A assembly as described in section 3-15.
10) Mount the mode lever assembly as described in section 3-14.
11) Mount the DC motor (capstan motor) as described in section 3-3.

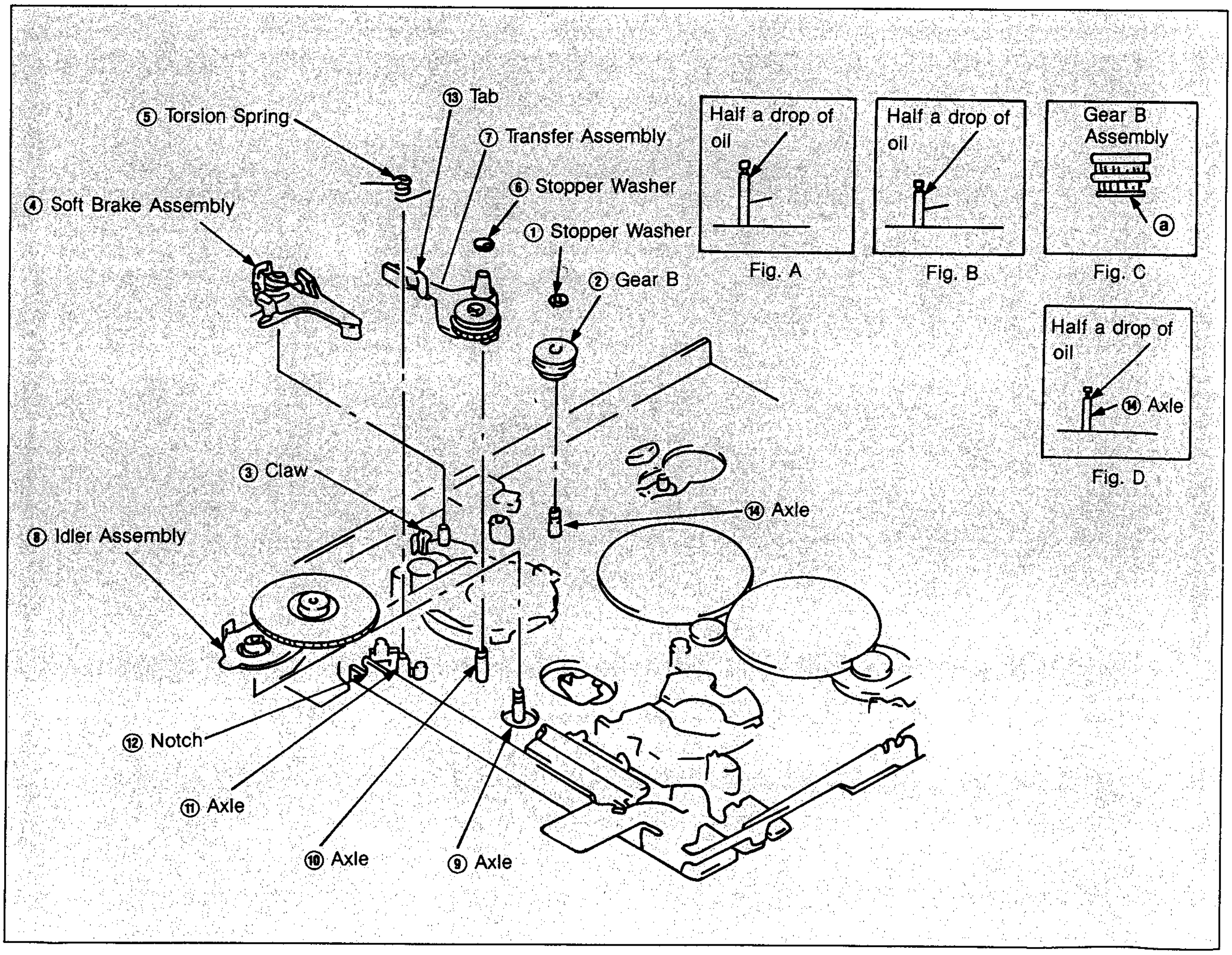

⑬ Tab
⑤ Torsion Spring
⑦ Transfer Assembly
⑥ Stopper Washer
④ Soft Brake Assembly
① Stopper Washer
② Gear B
Half a drop of oil
Fig. A
Half a drop of oil
Fig. B
Gear B Assembly
ⓐ
Fig. C
Half a drop of oil
⑭ Axle
Fig. D
③ Claw
⑭ Axle
⑧ Idler Assembly
⑫ Notch
⑪ Axle
⑩ Axle
⑨ Axle

Fig. 3-17.

3-17. SMALL GEAR, UL BRAKE, SMALL LEVER BASE SPRING

1. Removal (See Fig. 3-18.)

1. Remove the mode lever assembly as described in section 3-14.
2) Remove the stopper washer ①, then remove the small gear ②.
3) Remove the small lever ③, the 1.6 mm-diameter poly washer ④ and the base spring ⑤.
4) Remove the UL brake ⑥.

2. Installation (See Fig. 3-18.)

1) Mount the UL brake ⑥.
2) Apply half a drop of oil to the axle ⑦ (See Fig. A.)
3) Mount the base spring ⑤ to the axle ⑦ as shown in Fig. B, then install the 1.6mm-diameter poly washer ④.
4) Mount the small lever ③ to the axle ⑦ so that the protrusion ⑧ comes into the groove ⑨ of the UL brake ⑥.
5) Mount the small gear ② to the axle ⑦ and engage it with the gear of the cam A assembly ⑩.
6) Install the stopper washer ①.

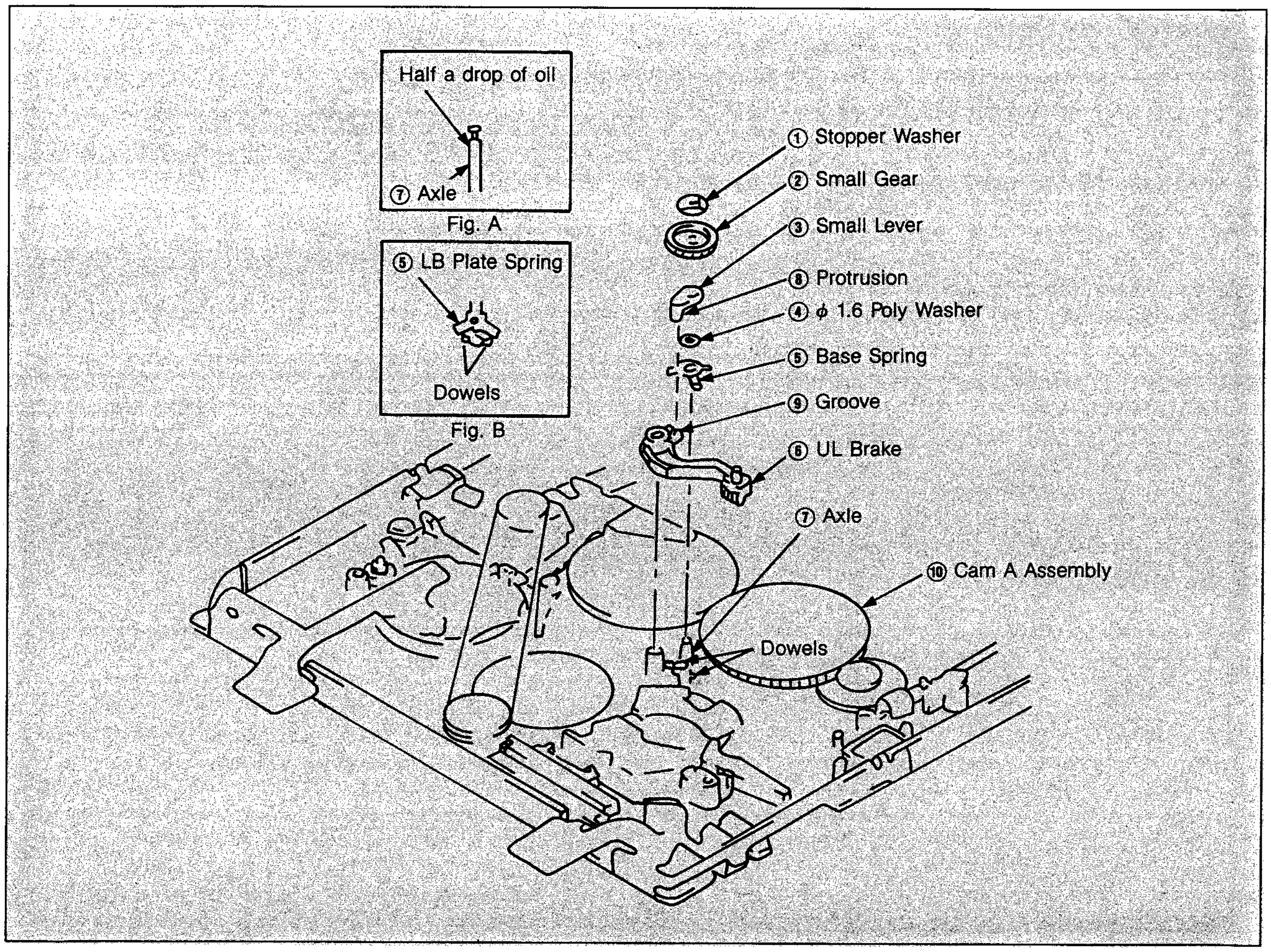

Half a drop of oil
⑦ Axle
Fig. A
⑤ LB Plate Spring
Dowels
Fig. B
① Stopper Washer
② Small Gear
③ Small Lever
⑧ Protrusion
④ ϕ 1.6 Poly Washer
⑤ Base Spring
⑨ Groove
⑥ UL Brake
⑦ Axle
⑩ Cam A Assembly
Dowels

Fig. 3-18

3-18. T LOADING ASSEMBLY, CAM B ASSEMBLY

Removal (See Fig. 3-19).

1) Remove the DC motor (capstan motor) as described in section 3-3.
2) Remove the drum unit as described in section 3-13.
3) Remove the mode lever assembly as described in section 3-14.
4) Remove the timing belt B, the reel gear assembly and the mode plate assembly as described in section 3-15.
5) Set the STOP mode.
6) Remove the screw ①, then remove the loading base ② and the T loading assembly ③.
7) Remove the two screws ④, then remoe he cover T ⑤.
8) Remove the stopper washer 1.5 ⑥, then remove the cam B assembly ⑦.

2. Installation (See Fig. 3-19).

1) Grease the points of the mechanism chassis shown in Fig. A.
2) Apply half a drop of oil to the axle ⑧ (See Fig. F).
3) Grease pin ⑨, axle ⑩ and dowel ⑭ of the T loading assembly ③ (See Fig. D)
4) Mount by aligning the pin ⑨ and the axle ⑩ with the slot ⑪ of the mechanism chassis.
5) Move the can follower ⑫ in the direction of the arrow Ⓐ to put it out of the way.
6) Mount the can B assembly ⑦ to the axle ⑧, and engage it with the can A assembly ⑬ as shown in Fig. B.
7) Align the ⓐ part with the ⓑ part, and the hole ⑭ with the pin ⑨ of the T loading assembly ③.
8) Install the stopper washer 1.5 ⑥.
9) Mount by aligning the coaster loading base ② with the axle ⑩ of the T loading assembly ③ and pin ⑨, then secure with the screw ①.
10) Mount the cover T ⑤ aligning it with the dowel ⑮, then tighten the two screws ④ in the indicated order.
11) Grease the points indicated in Figs. C and E.
12) Mount the timing belt B, the reel gear assembly and the mode plate assembly as described in section 3-15.
13) Mount the mode lever assembly as described in section 3-14.
14) Mount the drum unit as described in section 3-13.
15) Mount the DC motor (capstan motor) as described in section 3-3.

Note:
- Screw ① should be tightened with a tightenign torque of approx. 500g·cm. If tightened too much, the S looding assembly ③ and the loading base ② will be deformed.
- After installing, be sure to perform tape path adjustment as described in section 4.

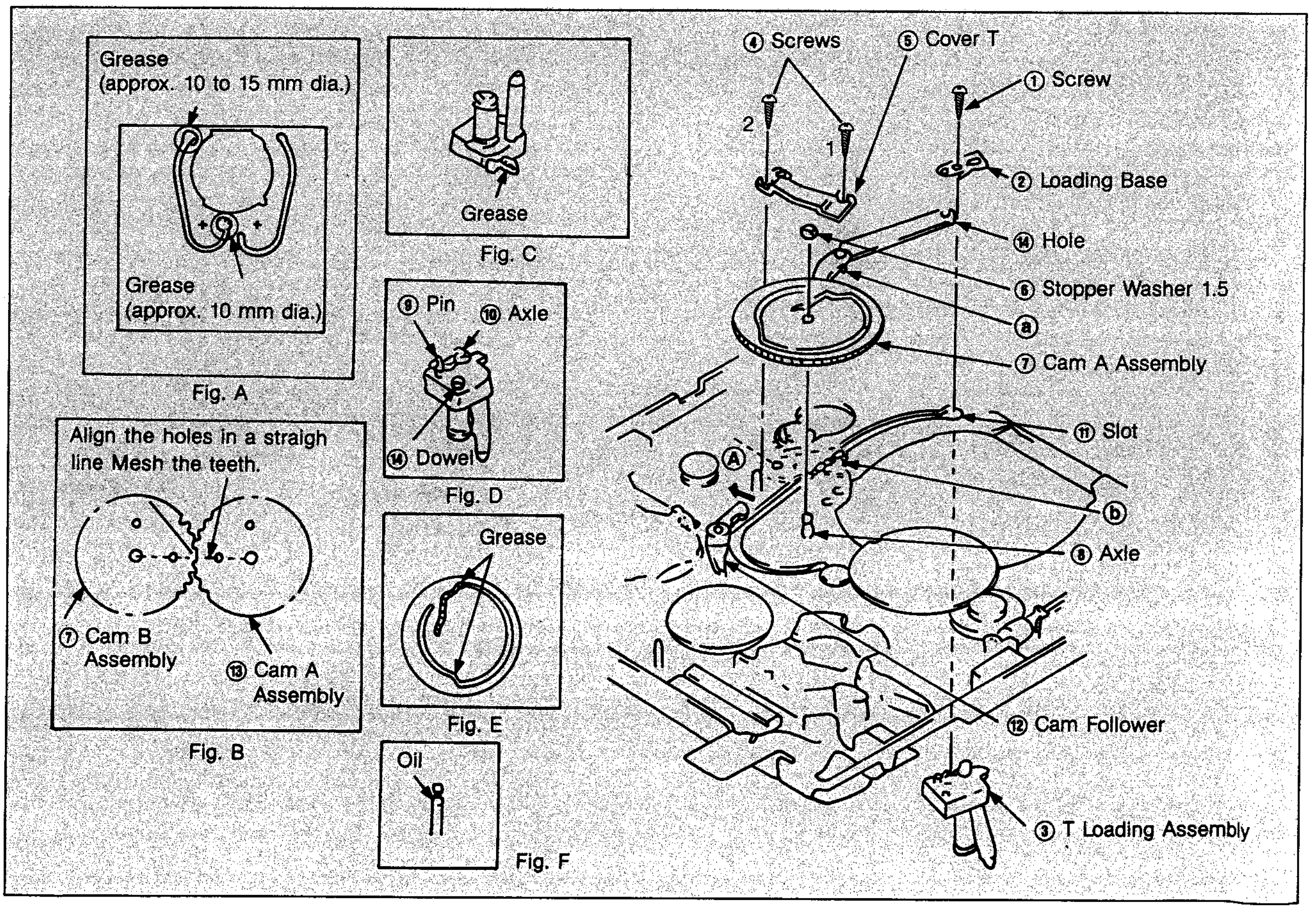

Grease
(approx. 10 to 15 mm dia.)
Grease
(approx. 10 mm dia.)
Fig. A
Align the holes in a straigh line Mesh the teeth.
⑦ Cam B Assembly
⑬ Cam A Assembly
Fig. B
Grease
Fig. C
⑨ Pin
⑩ Axle
⑭ Dowel
Fig. D
Grease
Fig. E
Oil
Fig. F
④ Screws
⑤ Cover T
2
1
① Screw
② Loading Base
⑭ Hole
⑥ Stopper Washer 1.5
ⓐ
⑦ Cam A Assembly
⑪ Slot
Ⓐ
ⓑ
⑧ Axle
⑫ Cam Follower
③ T Loading Assembly

Fig. 3-19.

3-19. S LOADING ASSEMBLY, CAM A ASSEMBLY

1. Removal (See Fig. 3-20.)

1) Remove the DC motor (capstan motor) as described in section 3-3.
2) Remove the drum assembly as described in section 3-13.
3) Remove the mode lever assembly and the pinch lock assembly as described in section 3-14.
4) Remove the timing belt B, the reel gear assembly and the mode plate assembly as described in section 3-15.
5) Remove the T loading assembly and the cam B assembly as described in section 3-18.
6) Remove the screw ①, then remove the loading base ② and the S loading assembly ③.
7) Remove the two screws ④, then remove the cover S assembly ⑤
8) Remove the stopper washer 1.5 ⑥, then remove the cam A assembly ⑦.

2. Installation (See Fig. 3-20.)

1) Grease the points of the mechanism chassis shown in Fig. A.
2) Apply half a drop of oil to the axle ⑧ (See Fig. E).
3) Grease pin ⑨, axle ⑩ and dowel ⑯ of the S loading assembly ③ (See Fig. B).
4) Mount by aligning the pin ⑨ and the axle ⑩ with the slot ⑪ of the mechanism chassis.
5) Fit the cam A assembly ⑦ to the axle ⑧, and mount so that the gear engages with the wheel load ⑬ and the small gear ⑭.
6) Align the ⓐ part with the slot ⑪, and the hole ⑭ with the pin ⑨ of the S loading assembly ③.
7) Install the stopper washer 1.5 ⑥.
8) Mount by aligning the loading base ② with the axle ⑩ and pin ⑨ of the S loading assembly ③, then secure with the screw ①.
9) Mount the cover S assembly ⑤ aligning it with the dewel ⑮, then tighten the two screws ④ in the indicated order.
10) Grease points indicated in Figs. C and D.
11) Mount the T loading assembly and the cam B assembly as described in section 3-18.
12) Mount the timing belt B, the reel gear assembly and the mode plate assembly as described in section 3-15.
13) Mount the mode lever assembly and the pinch lock assembly as described in section 3-14.
14) Mount the drum assembly as described in section 3-13.
15) Mount the DC motor (capstan motor) as described in section 3-3.

Note:
- Screw ① should be tightened with a tightening torque of approx. 500g•cm. If tightened too much, the S loading assembly ③ and the loading base ② will be deformed.
- After installing, be sure to perform tape path adjustment as described in section 4.

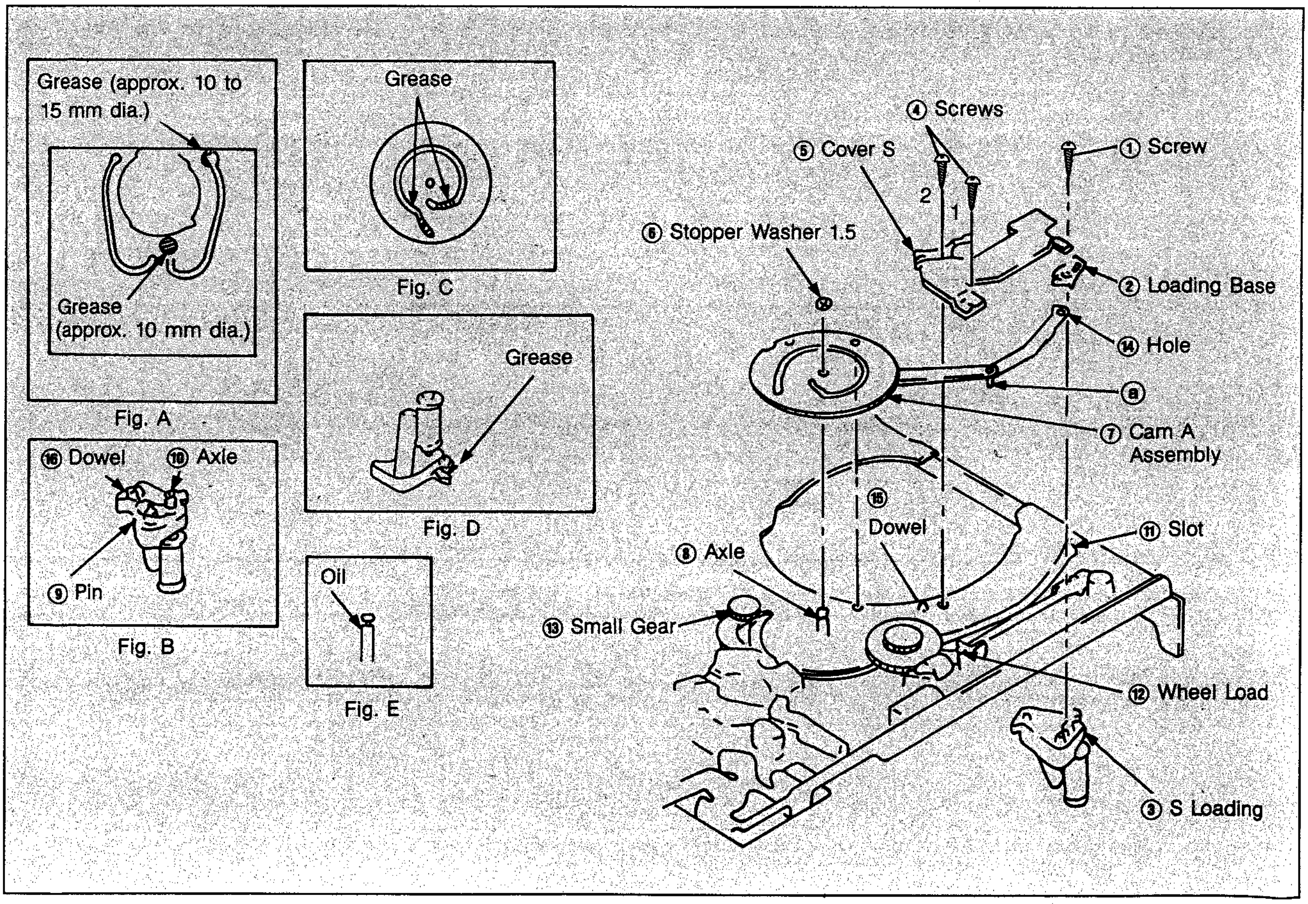

Grease (approx. 10 to 15 mm dia.)
Grease (approx. 10 mm dia.)
Fig. A
⑯ Dowel
⑩ Axle
⑨ Pin
Fig. B
Grease
Fig. C
Grease
Fig. D
Oil
Fig. E
④ Screws
⑤ Cover S
① Screw
2
1
⑥ Stopper Washer 1.5
② Loading Base
⑭ Hole
ⓐ
⑦ Cam A Assembly
⑮ Dowel
⑪ Slot
⑧ Axle
⑬ Small Gear
⑫ Wheel Load
③ S Loading

Fig. 3-20.

3-20. LOADING MOTOR, CAM FOLLOWER, WHEEL LOAD WORM ASSEMBLY

1. Removal (See Fig. 3-21).

1) Remove the DC motor (capstan motor) as described in section 3-3.
2) Remove the mode lever assembly and the pinch lock assembly as described in section 3-14.
3) Remove the timing belt B, the reel gear assembly and the mode plate assembly as described in section 3-15.
4) Remove the cam B assembly as described in section 3-18.
5) Remove the cam A assembly as described in section 3-19.
6) Remove the two screws ①, then remove the loading motor assembly ②.
7) Remove the cam follower ③
8) Remove the stopper washer ④, then remove the wheel load ⑤.
9) Remove the worm assembly ⑥ from the six claws ⑦.

2. Installation (See Fig. 3-21.)

1) Mount the worm assembly ⑥, matching it to the six claws ⑦.
2) Grease the shaded parts of the worm assembly ⑥ (five places) (See Fig. A.)
3) Apply half a drop of oil to the axle ⑧ (See Fig. B).
4) Fit the wheel load ⑤ to the axle ⑧ and engage it with the gear of the worm assembly ⑥.
5) Mount the cam follower ③.
6) Grease the whole perimeter of the gear of the loading motor assembly ②.
7) Align the loading motor assembly ② with the mechanism chassis and secure it with the two screws ②.
8) Mount the cam A assembly as described in section 3-19.
9) Mount the cam B assembly as described in section 3-18.
10) Mount the timing belt B, the reel gear assembly and the mode plate assembly as described in section 3-15.
11) Mount the mode lever assembly and the pinch lock assembly as described in section 3-14.
12) Mount the DC motor (capstan motor) as described in section 3-3.

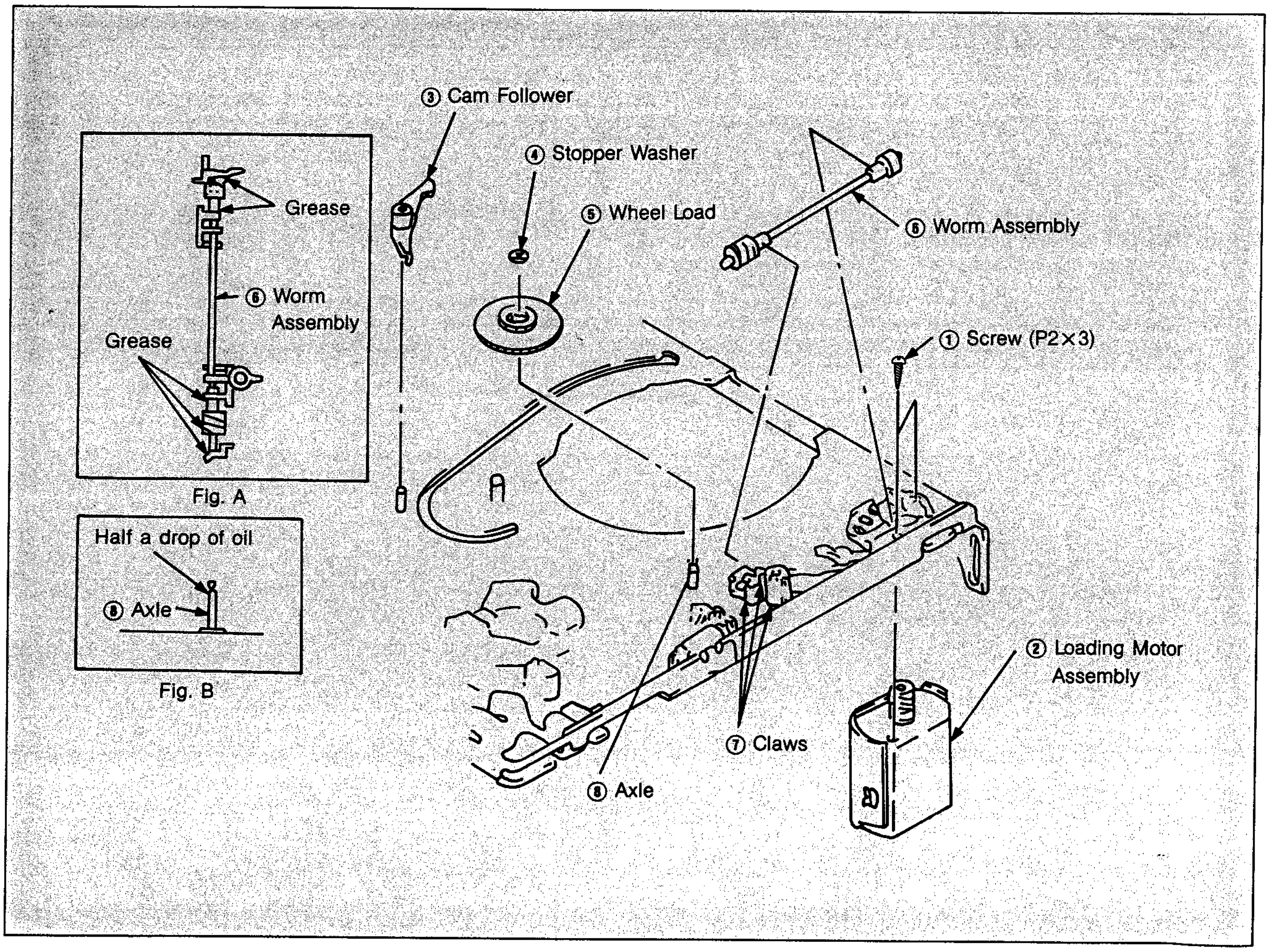

Grease
⑥ Worm Assembly
Grease
Fig. A
Half a drop of oil
⑧ Axle
Fig. B
③ Cam Follower
④ Stopper Washer
⑤ Wheel Load
⑥ Worm Assembly
① Screw (P2×3)
A
② Loading Motor Assembly
⑦ Claws
⑧ Axle

Fig. 3-21.

3-21. ROTARY UPPER DRUM REPLACEMENT

1. Removal

- If possible, make a recording before removal.

1) Remove the two screws ① (See Fig. 3-22.)
2) Mount the jig ④ (Servicing tools No. 6) with the two supplied screws ②, then screw the attached hexagon socket screws ③ to the jig ④. The rotary upper drum ⑤ will move upward and come off (See Fig. 3-23.)

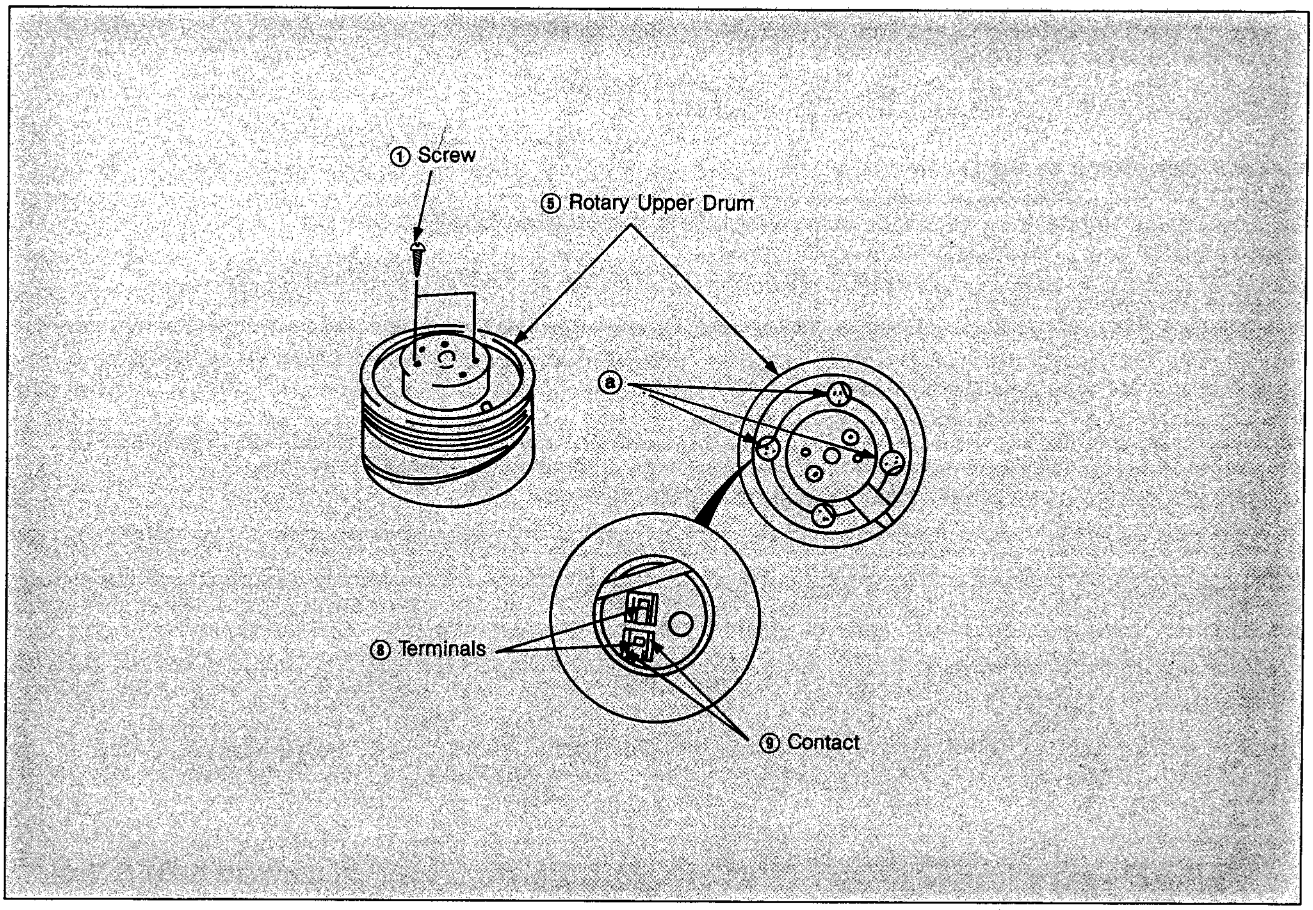

① Screw
⑤ Rotary Upper Drum
ⓐ
⑧ Terminals
⑨ Contact

Fig. 3-22.

2. Installation

1) Wipe clean the flange surface and the rotary upper drum ⑤ surface that makes contact with it, and confirm that they are free from dirt and scratches.
2) Insert the jig ⑦ (Servicing tools No. 6) into the drum positioning hole, then set the rotary upper drum ⑤ by passing the jig through its positioning hole ⑥.
   Note: Confirm that the terminals ⑧ protrude slightly from the contact ⑨ of the rotary upper drum ⑤ at the three points a (See Figs. 3-22 and 3-24.)
3) Remove the jig ⑦ and push down the rotary upper drum ⑤ gently by hand. If it does not go all the way down, secure it temporarily by tightening the two hexagon socket screws ① alternately.
4) Insert the jig ⑦ into the positioning hole ⑥ again and confirm that it goes in smoothly. If it does not, loosen the two screws ①, repeat step 3 of the Removal paragraph and restart the setting procedure.
5) Tighten the two screws ①.

Note: After installing, be sure to perform tape path adjustment as described in section 4.

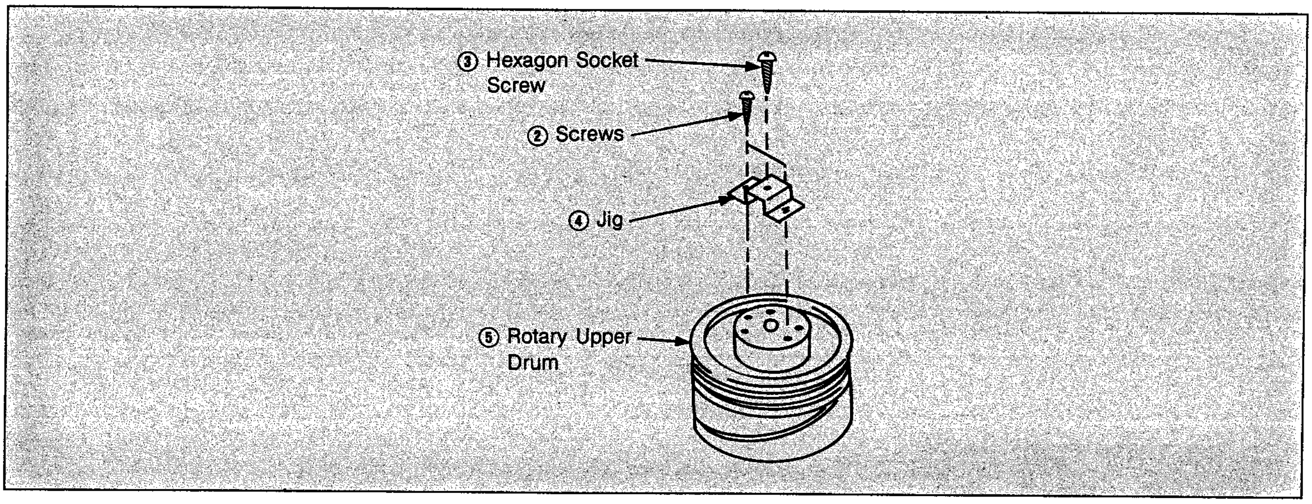

③ Hexagon Socket Screw
② Screws
④ Jig
⑤ Rotary Upper Drum

Fig. 3-23.

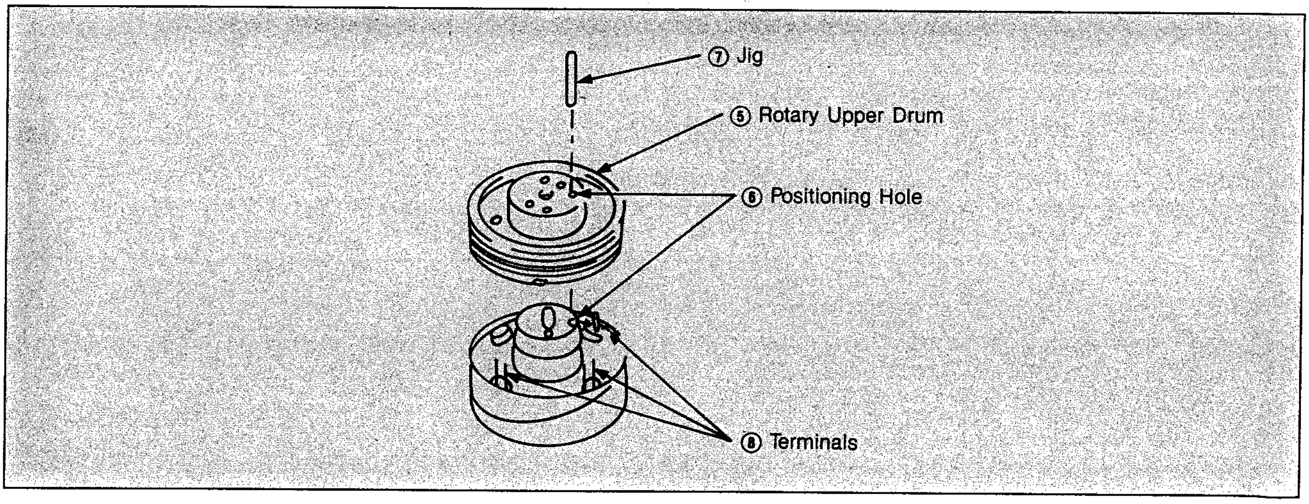

⑦ Jig
⑤ Rotary Upper Drum
⑥ Positioning Hole
⑧ Terminals

Fig. 3-24.

3-22. FWD BACK TENSION (See Fig. 3-25).

1) Set the torque cassette (Servicing tools No.2)
2) Set the FWD mode and confirm that S reel table torque value is within 9 to 13 g•cm.
3) If the torque value does not meet the specification, adjust the adjust arm. ①

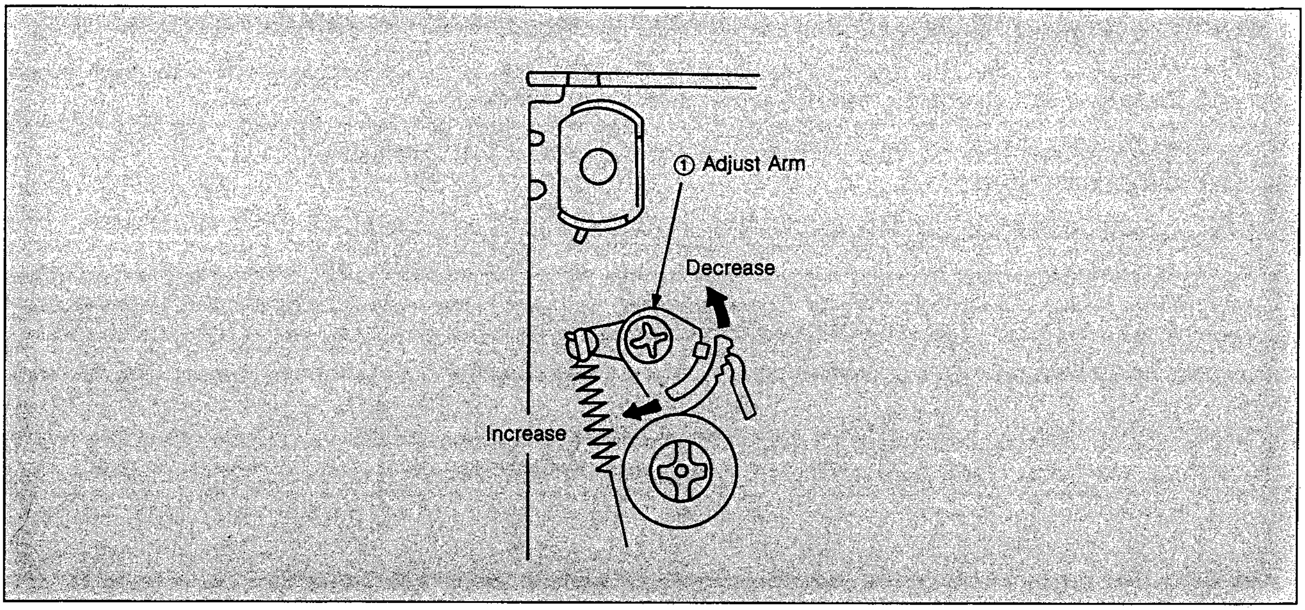


Fig. 3-25.

3-23. REEL TORQUE CHECK

1) Set the torque cassette.
2) Set the FWD mode and confirm that T reel table torque value is within 7 to 15 g•cm.
3) Set the REV mode and confirm that S reel table torque value is within 29±6 g•cm
4) Set the REV mode and confirm that T reel table torque value is within 13 to 25 g•cm.
5) If a torque value does not meet the specifications above, replace the corresponding reel table.

4. TAPE PATH ADJUSTMENT

(The Track Shift Mode)
In the 8mm video system, instantaneous tape speed control is performed using four kinds of pilot signals, and high-precision tracking is achieved through the ATF (Automatic Track Finding) system. This makes a tracking control knob unnecessary and allows for precise tracing.
On the other hand, however, tape path adjustment presents some difficulties when the ATF system is used. Namely, since the ATF system will autoamtically compensate to some degree for head tracing errors, thorough adjustment is not possible. This can be sloved by setting the track shift mode for tracking fine adjustment. ATF will be compulsorily activated shifting the tracking amount by a fixed amount (approx. 1/3) and thus making tracking fine adjustment easy. Furthemore, no track shift jigs are required.

4-1. TRACK SHIFT MODE SETTING.

(Setting Procedure)
1) Short-circuit Pins ① and ④ of P3008 on the SS-10 board
2) Playback an alignment tape for tracking adjustment (Servicing tools No.1)

(Note on Adjustment of No. 7 Guide (TG-7))
The height adjustment screw for No. 7 guide (TG-7) is located at some distance from the guide (refer to Fig. 4-2). Therefore, when performing section 4-6. No.7 Guide (TG-7) Adjustment it is convenient to use the alignment tape for tracking (servicing tools No.1) modified as follows, and perform adjustment in playback mode.

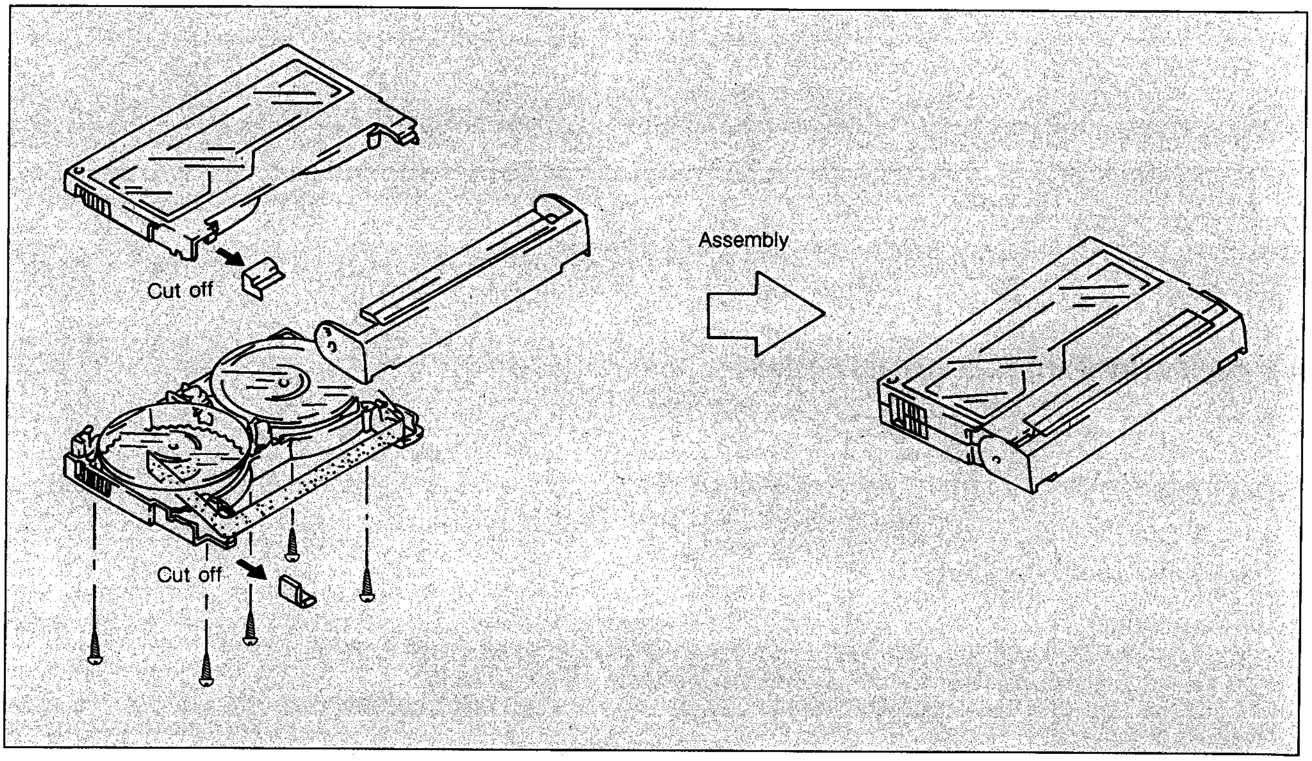


Fig. 4-1

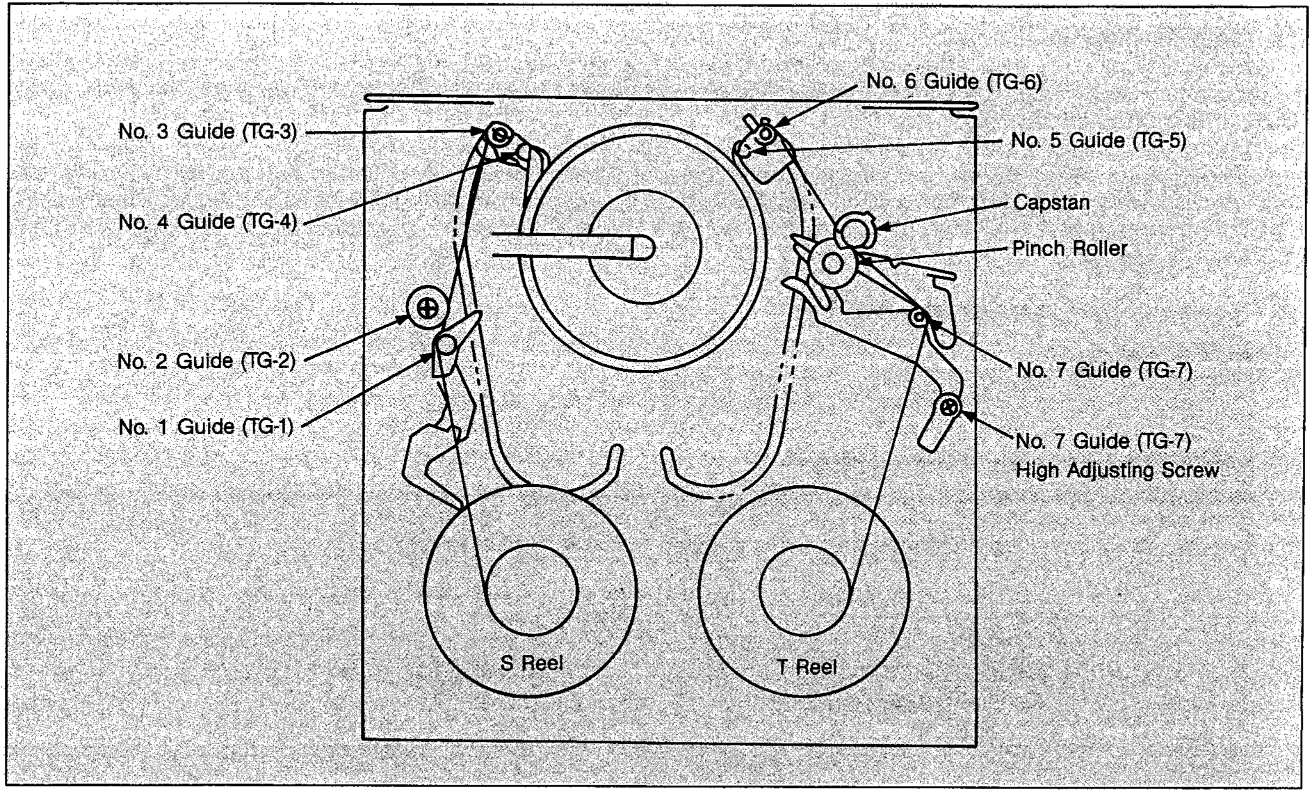

No. 6 Guide (TG-6)
No. 3 Guide (TG-3)
No. 5 Guide (TG-5)
No. 4 Guide (TG-4)
Capstan
Pinch Roller
No. 2 Guide (TG-2)
No. 7 Guide (TG-7)
No. 1 Guide (TG-1)
No. 7 Guide (TG-7)
High Adjusting Screw
S Reel
T Reel

Fig. 4-2.

4-2. PREPARATIONS FOR ADJUSTMENT

Signal : Alignment Tape (Servicing tools No.1)
(NTSC: WR5-1NP)
(PAL: WR5-1CP)
Measuring point : CH 1: PB RF (P3008 ③ SS-10)
GND (P3008 ① SS-10)
CH2: RF SWP (P3008 ⑥ SS-10)
Measuring equipment: Oscilloscope

Checking method:
1) Clean tape path surfaces (tape guides, drum, capstan shaft, pinch roller) (See Fig. 4-2)
2) Play back the alignment tape for tracking adjustment (Servicing tools No. 1)
3) Confirm that both the entrance and exit side RF waveforms of the oscilloscope are flat (See Fig. 4-3). If they are not, adjust as follows.

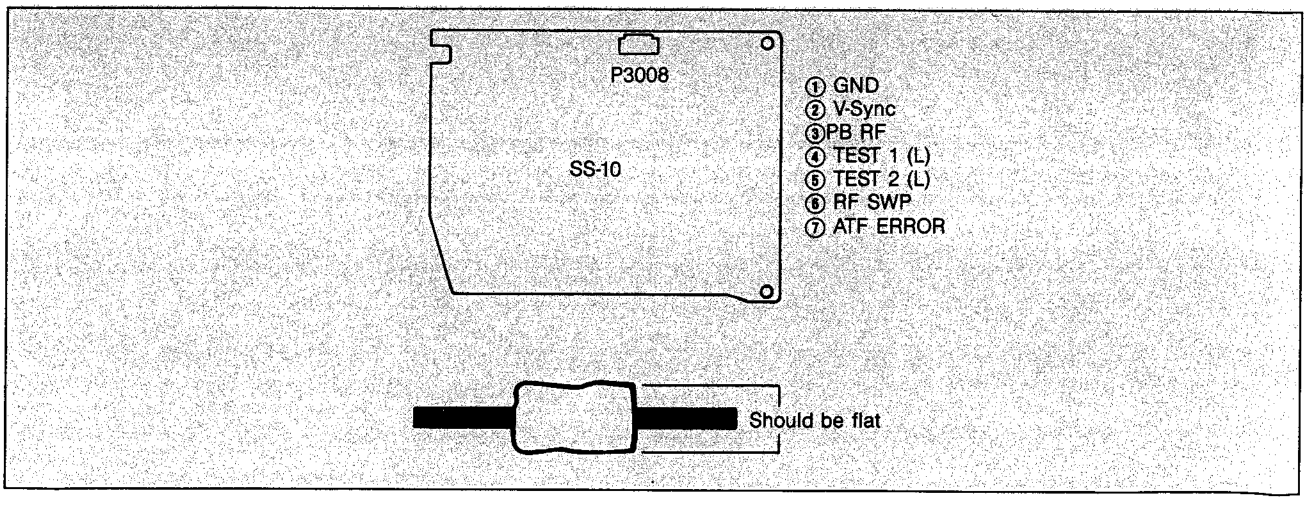

P3008
SS-10
① GND
② V-Sync
③PB RF
④ TEST 1 (L)
⑤ TEST 2 (L)
⑥ RF SWP
⑦ ATF ERROR
Should be flat

Fig. 4-3.

4-3. TRACKING ADJUSTMENT (See Fig. 4-4)

1) Play back the alignment tape for tracking adjustment.
2) Put a screwdriver through the hole ①, and loosen the lockscrew ② slightly. Turn the guide No. 3 (TG-3) ③ to make the waveform on inlet side flat.
3) Put a screwdriver through the hole ④, and loosen the lockscrew ⑤ slightly. Turn the guide No. 6 (TG-6) ⑥ to make the waveform on outlet side flat.

Note: Take care not to loosen lockscrews too much, since guides come loose easily.

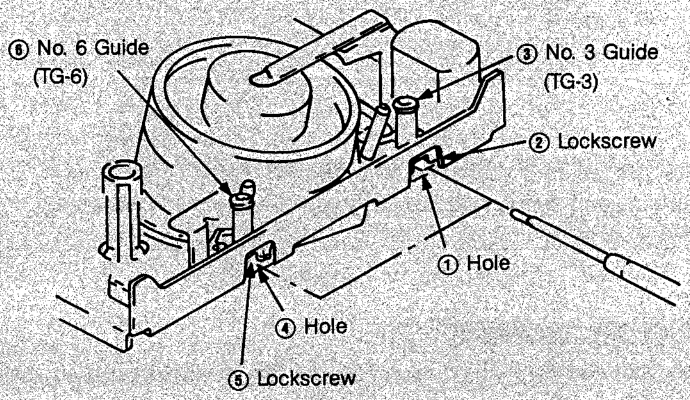

⑥ No. 6 Guide (TG-6)
③ No. 3 Guide (TG-3)
② Lockscrew
① Hole
④ Hole
⑤ Lockscrew

Fig. 4-4.

4-4. TRACKING FINE ADJUSTMENT (See Figs. 4-4 and 4-5)

1) Play back the alignment tape for tracking adjustment and set the track shift mode.
2) Confirm whether the waveform is flat. If it is not, turn the No. 3 (TG-3) and No. 6 (TG-6) guides so that it becomes flat.
3) Fix the No. 3 guide ③ by tightening its lockscrew ②. Then confirm that the entrance side waveform has not changed.
4) Fix the No. 6 guide ⑥ by tightening its lockscrew ⑤. Then confirm that the exit side waveform has not changed.

Note: The set screws ② and ⑤ should be tightened with a tightening torque of approx. 200g·cm±10%.
If tightened too much, there is danger of damaging the tread.

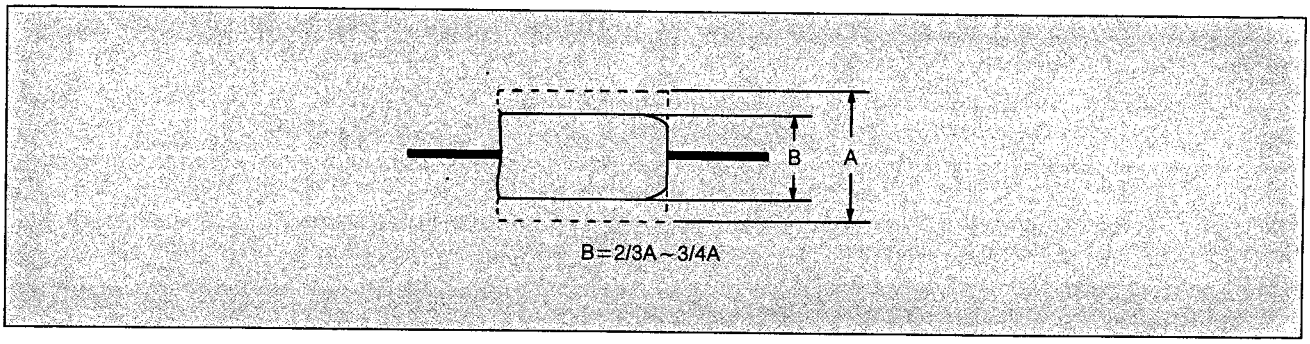


Fig. 4-5.

4-5. No. 2 GUIDE (TG-2) ADJUSTMENT

When the No. 2 guide has been turned or replaced, perform height presetting before this adjustment.

4-5-1. No. 2 Guide (TG-2) Height Presetting (See Fig. 4-6)

1) Adjust the height from the mechanism chassis upper surface to the TG-2 upper flange ① upper surface to 18.6 mm by rotating the TG-2 upper flange ①.

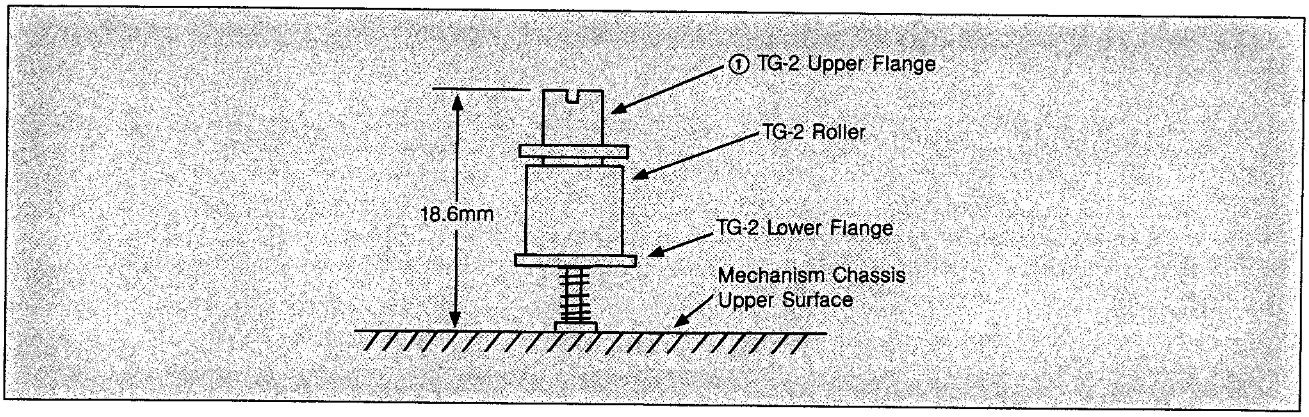


Fig. 4-6.

(Reference)
This A-mechanism is equipped with four adjustable guides (TG-2, 3, 6 and 7). To raise or lower the respective guide rotate the corresponding adjustment screw as shown below.

Guide	Guide adjustment	Rotating direction of adjustment screw
TG-2, 3, 6	Raise	Counterclockwise
	Lower	Clockwise
TG-7	Raise	Clockwise
	Lower	Counterclockwise

4-5-2. No. 2 Guide (TG-2) Adjustment (See Figs. 4-7 and 4-8)

1) Play back a thin tape like the P6-120MP, etc. and set the REV mode.
2) Confirm that the tape is not bent at the lower flange ② of the No. 2 guide (TG-2) ① (See Fig. 4-7). If it is, turn the upper flange ③ of the No. 2 guide (TG-2) ① clockwise with a screwdriver, lowering it until the tape is straightened.
3) Play back the alignment tape for tracking adjustment.
4) Perform tracking adjustment and tracking fine adjustment as described in sections 4-3 and 4-4.
5) In the track shift mode. CUE/REV the tape, then play it back and confirm that the RF waveform rises flat within 2 seconds.
6) If the waveform is not normal (See Fig. 4-8) turn the upper flange ③ of the No. 2 guide (TG-2) ① 90° counter-clockwise and repeat step 5.
   Repeat steps 5 and 6 until a normal waveform is obtained. Then, confirm that the tracking waveform has not changed. If it has, perform fine adjustment of entrance side tracking and repeat step 5.

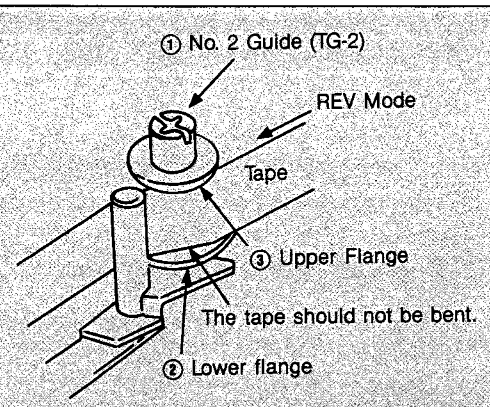

① No. 2 Guide (TG-2)
REV Mode
Tape
③ Upper Flange
The tape should not be bent.
② Lower flange

Fig. 4-7.

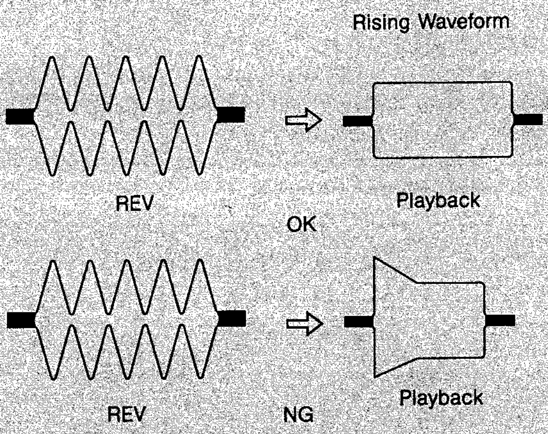

Rising Waveform
REV
OK
Playback
REV
NG
Playback

Fig. 4-8

4-6. No. 7 GUIDE (TG-7) ADJUSTMENT (See Fig. 4-10.)

1) Play back the alignment tape for tracking adjustment and set the REV mode.
2) Confirm that the tape is not bent between the No. 6 guide (TG-6) ① and the capstan ②. If it is, turn the hight adjusting screw ④ of the No. 7 guide (TG-7) ③ until the tape is straightened.
3) Set the playback mode again and confirm that the tape is not bent between the capstan ② and the No. 7 guide (specification: 0.5mm or less). If the tape is bent beyond the specification turn the hight adjusting screw ④ of the No. 7 guide (TG-7) ③ until bending is within the specification (0.5mm).
   If in the REV mode tape bending between the No.6 guide (TG-6) ① and the capstan ② is 0.3mm or less adjustment can be considered completed.

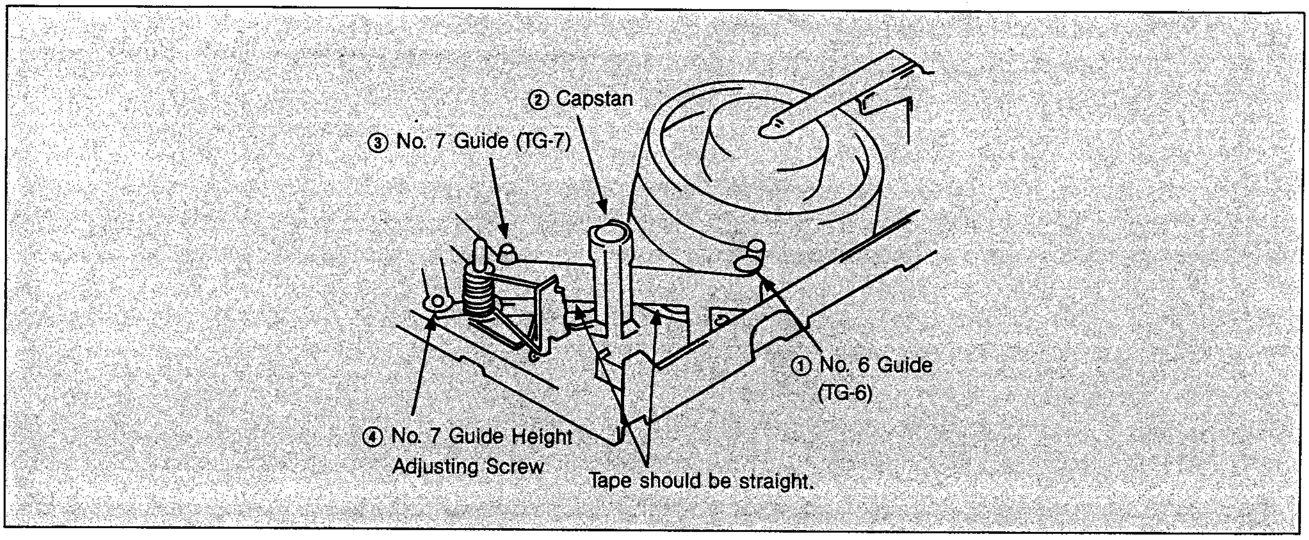


Fig. 4-9.

4-7. CUE AND REV WAVEFORM CHECK (See Fig. 4-10)

1) Play back the alignment tape for tracking adjustment and set the REV mode. Confirm that waveform peaks maintain a constant pitch of 5 seconds or more (See Fig. 4-10). In case pitch is not constant, perform section 4-4. Tracking Fine Adjustment and section 4-6. No. 7 Guide Adjustment.
2) Set the CUE mode. Confirm that waveform peaks still maintain a constant pitch of 5 seconds or more (See Fig. 4-10). Otherwise, perform section 4-4. Tracking Fine Adjustment.

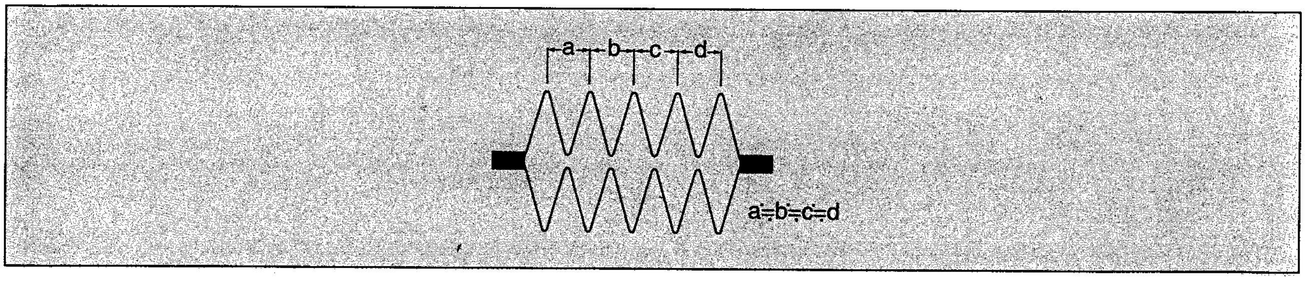


Fig. 4-10.

4-8. CHECK AFTER ADJUSTMENT

4-8-1. Tracking Check

1) Confirm that the amplitude of RF waveform is reduce to approx. 2/3 to 3/4 when the track shift mode is set (See Fig. 4-11).
2) Then confirm that the minimum amplitude value (EMIN) is 65% of the maximum value (EMAX) or larger (See Fig. 4-12).
3) Confirm that no large fluctuations occur on the waveform (See Fig. 4-13).

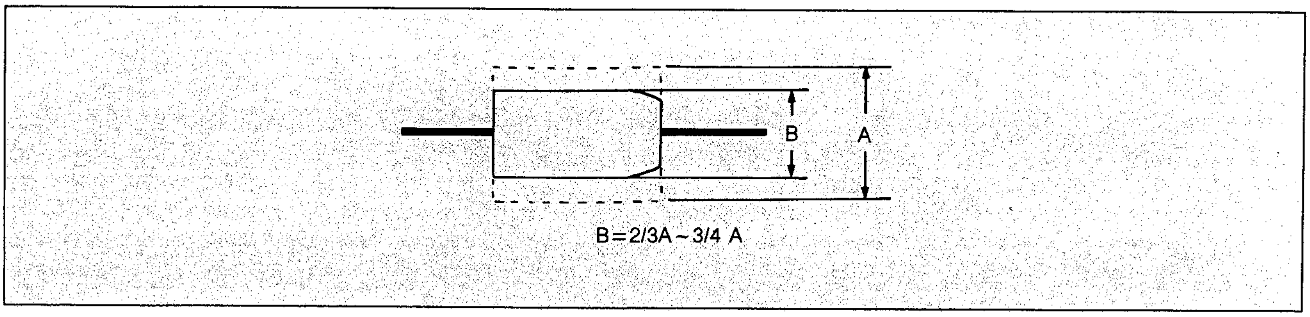


Fig. 4-11

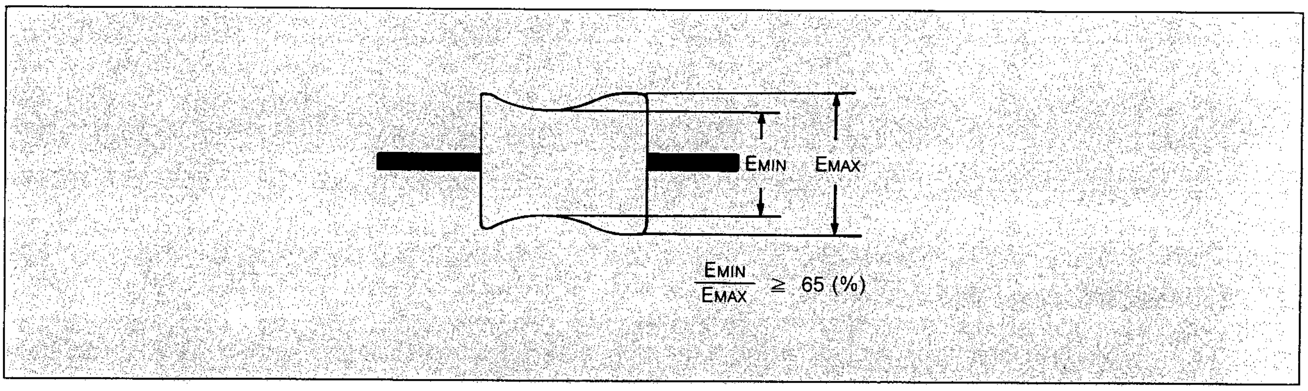

EMIN
EMAX
EMIN / EMAX ≧ 65 (%)

Fig. 4-12.

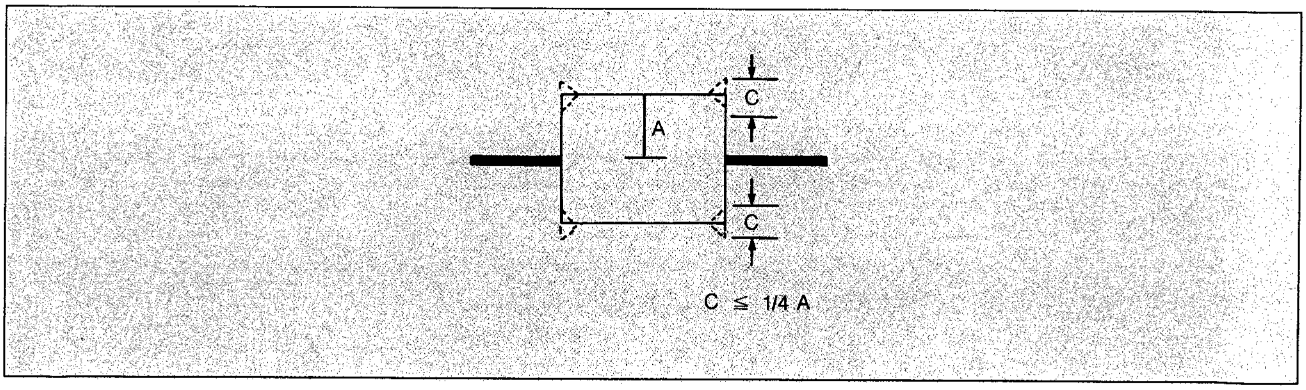


Fig. 4-13.

4-8-2. Rising Check (See Fig. 4-14)

1) Play back the alignment tape for tracking adjustment.
2) Cancel the track shift mode.
3) Eject the tape, then load it again.
4) Set the playback mode and confirm that the RF waveform rises flat within 2 seconds. Also confirm that the tape is not bent around the pinch roller (See Fig. 4-14).
5) CUE/REV and FF/REW the tape, then play it back and confirm that the RF waveform rises flat within 2 seconds. Also confirm that the tape is not bent around the pinch roller.
6) Repeat steps 3) to 5) once more.

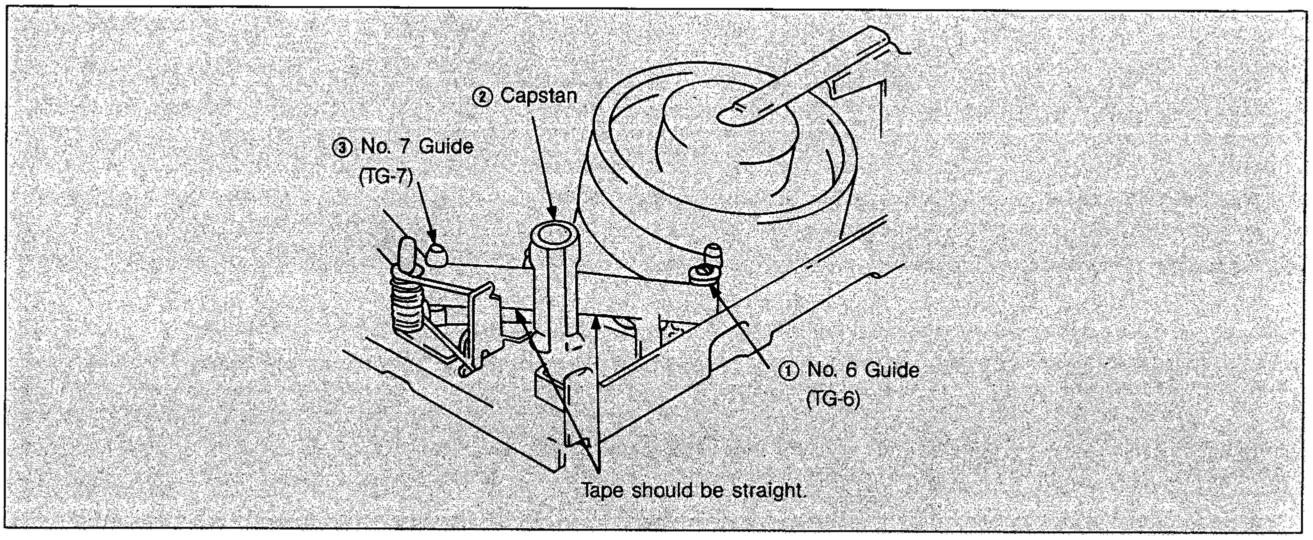

② Capstan
③ No. 7 Guide
(TG-7)
① No. 6 Guide
(TG-6)
Tape should be straight.

Fig. 4-14

4-8-3. Tape Path Check (See Fig. 4-15.)

1) Play back a thin tape like the P6-120MP (NTSC) or P5-90MP (PAL), etc. and confirm that no tape rising occurs, and that curling is less than 0.3 mm, at the lower flange of the No. 2 guide, the upper flange of the No. 3 guide, the upper flange of the No. 6 guide and the No. 7 guide upper and lower flanges.
2) Confirm that no tape rising occurs and that curling is less than 0.3mm at the flanges of all guide when pressing the FF button in the playback mode to set the CUE mode, or the REW button to set the REV mode.

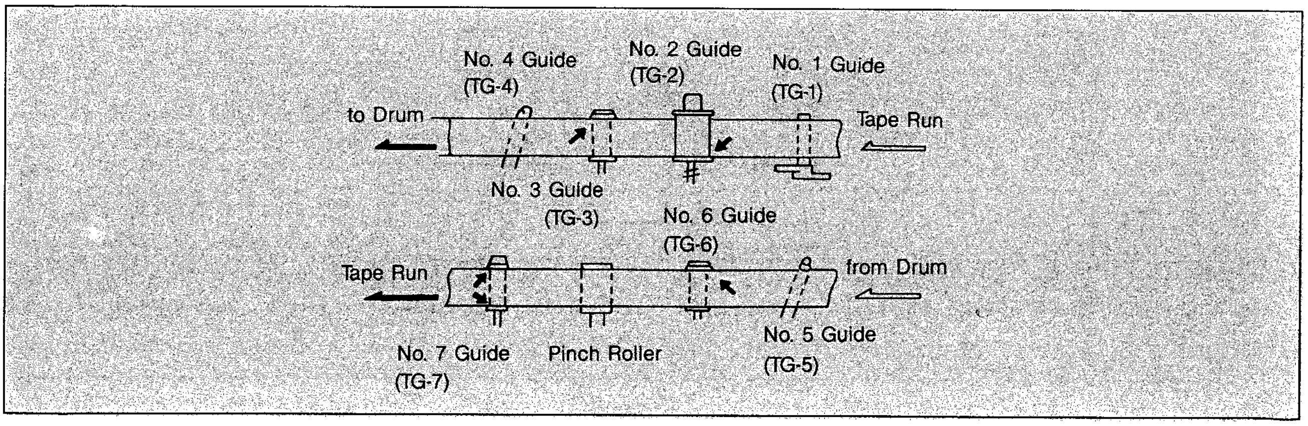
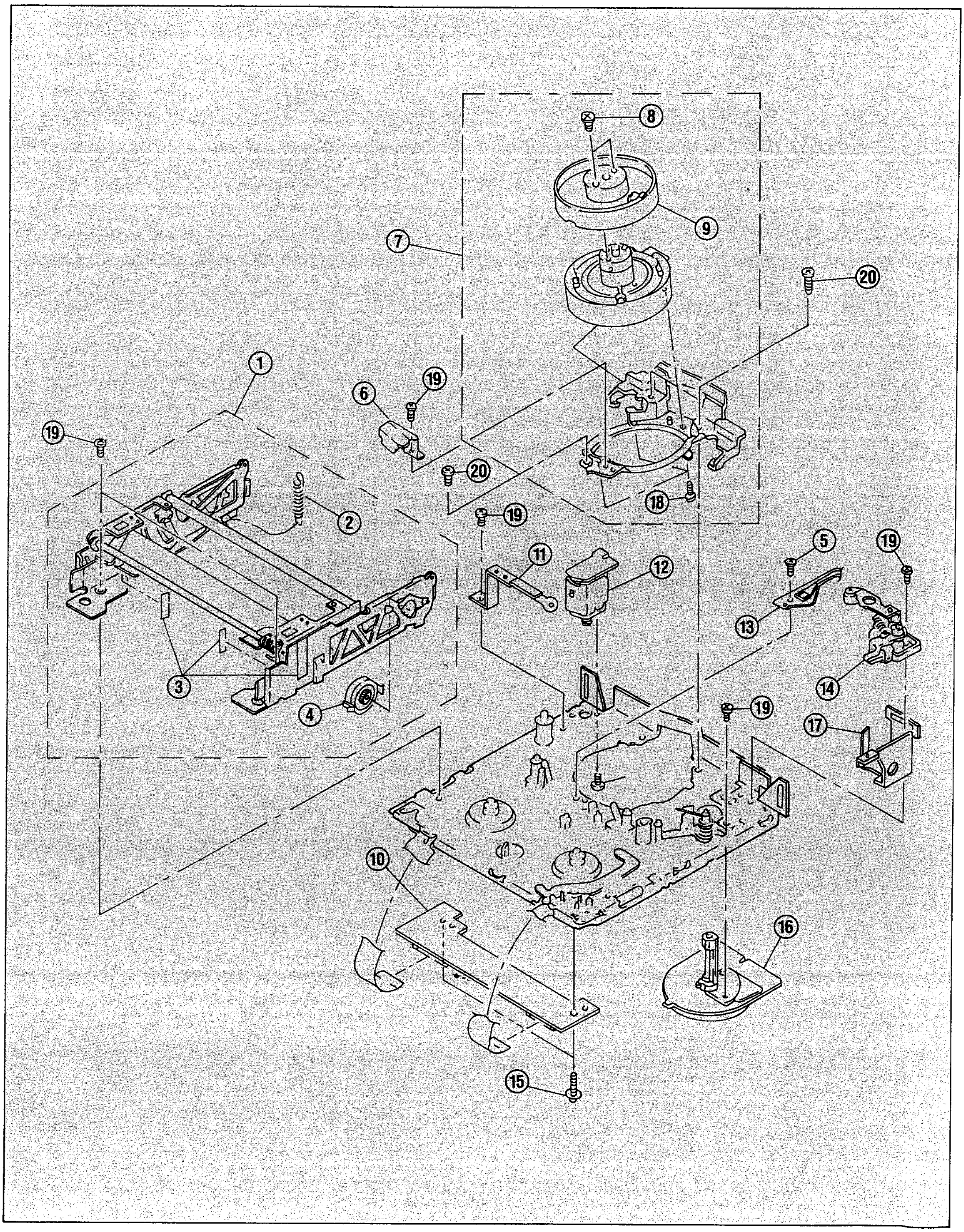

No. 4 Guide
(TG-4)
No. 2 Guide
(TG-2)
No. 1 Guide
(TG-1)
to Drum
Tape Run
No. 3 Guide
(TG-3)
No. 6 Guide
(TG-6)
Tape Run
from Drum
No. 7 Guide
(TG-7)
Pinch Roller
No. 5 Guide
(TG-5)

Fig. 4-15.

PART III
EXPLODED VIEW

Exploded View (I)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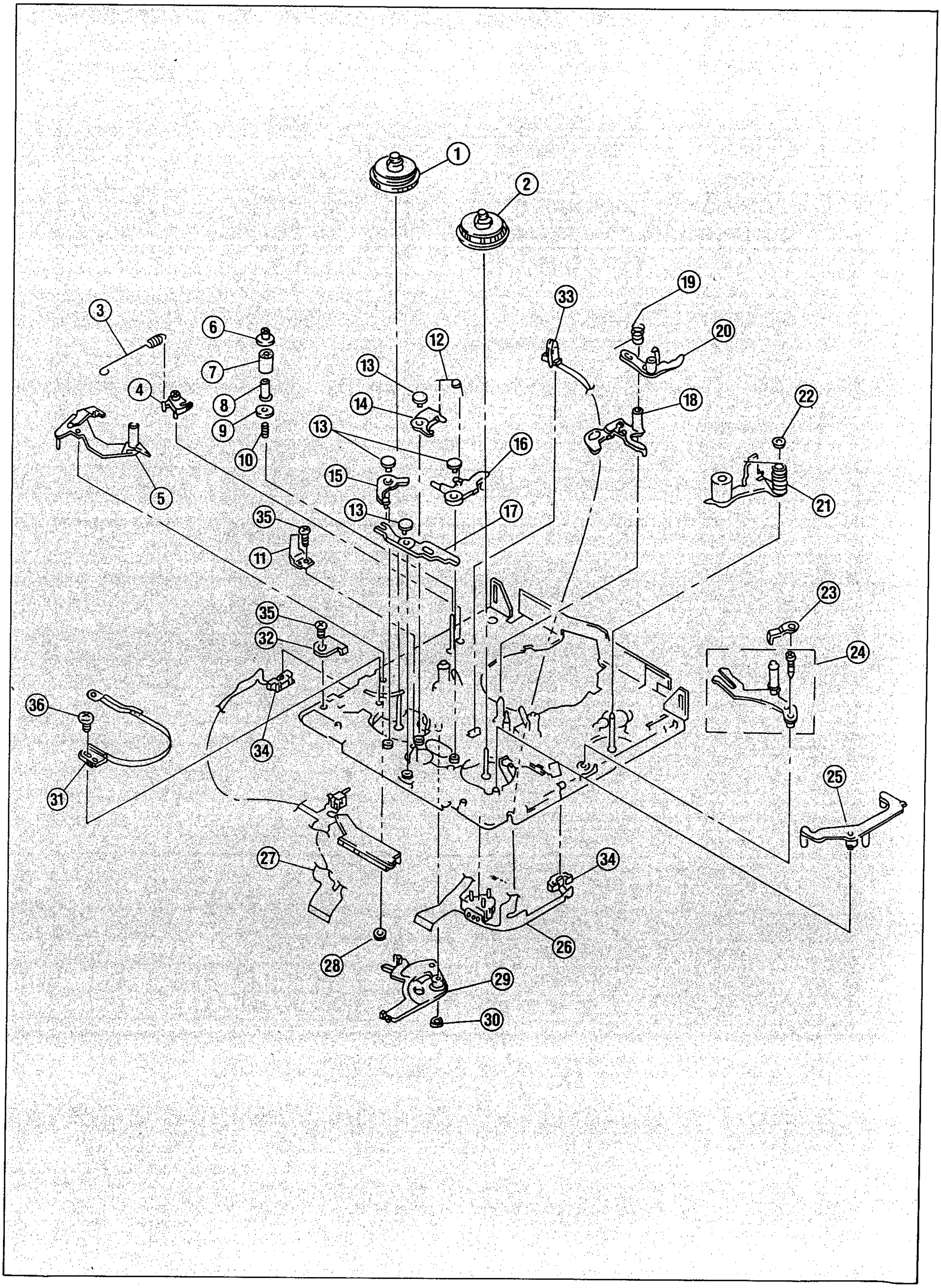
NO	PART CODE	PART NAME	Q'TY	DESCRIPTION	REMARK
1	97SA258000	CST HOUSING AS	1		
2	97S3029000	SPRING PULL	1	SUS 304 WPB	
3	97S3401900	SHEET TEFRON	2	TEFRON	BLK
4	97SB870000	DAMFER AS	1		
5	7001141811	SCREW MACHIN	1	PAN 1.4×1.8	MFZN
6	97S0433900	COVER PROTECT	1	A5052P T1.0	
7	97SA254700	DRUM TOTAL AS	1		
8	7601200512	SCREW MACHINE	2	PAN 2×5 PW	
9	97SA480000	UPPER DRUM AS	1		
10	97PB154600	PCB DECK RELAY AS	1		
11	97SB372700	EARTH PLATE AS	1		
12	97SB384800	LOADING MOTOR AS	1		
13	97SB370610	DEW SENSOR AS	1		
14	97SB372600	HEAD CLEANING AS	1		
15	7001200312	SCREW MACHINE	2	PAN 2×3	
16	97S8103200	MOTOR CAPSTAN	1	U-22A	
17	97S2431200	BRKT PRE AMP	1	A5052P T0.8	
18	7051200511	SCREW MACHINE	3	PAN 2×5 SW	
19	7001200312	SCREW MACHINE	9	PAN 2×3	
20	7001200612	SCREW MACHINE	3	PAN 2×6	

Exploded View (II)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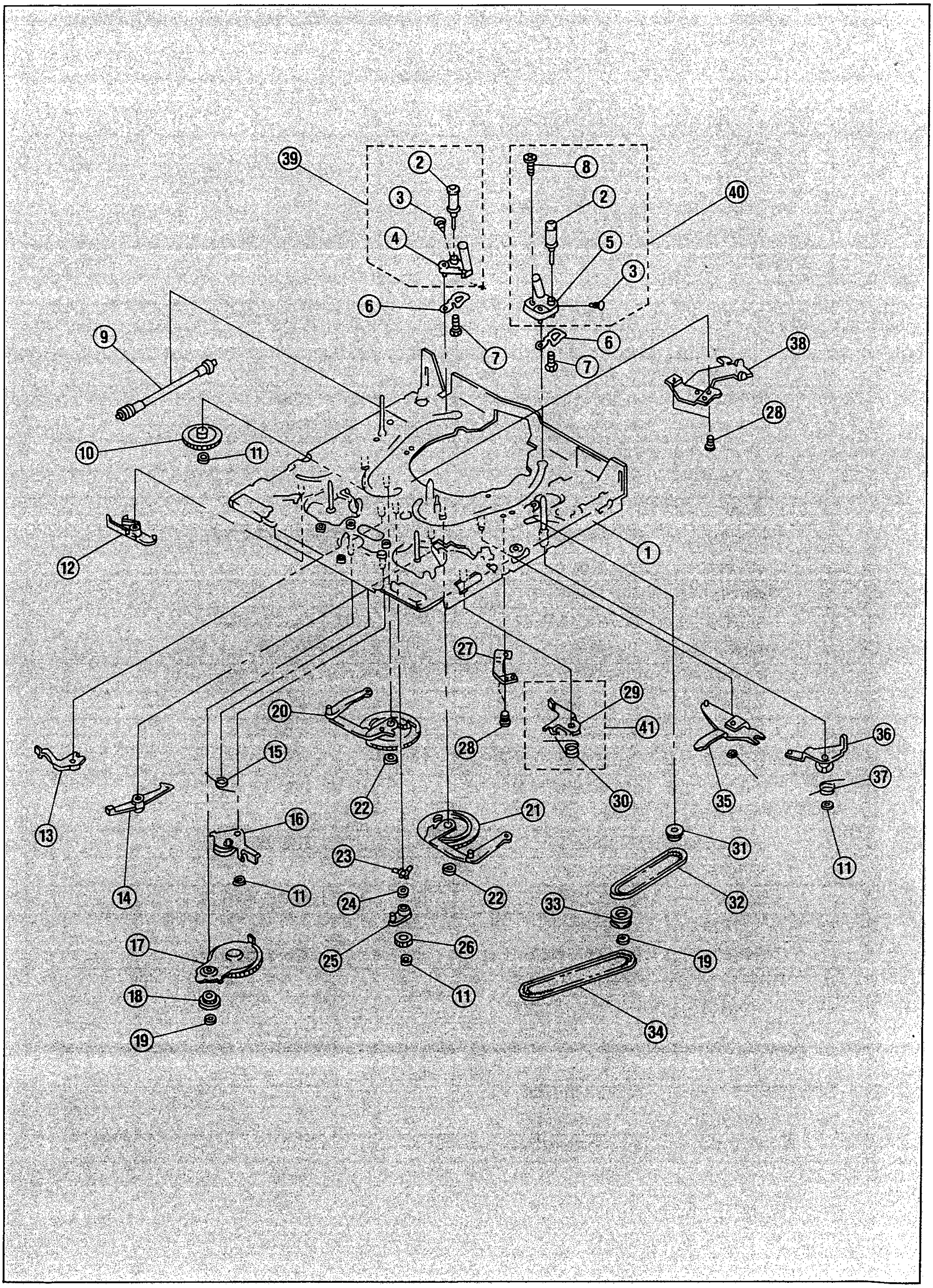
NO.	PART CODE	PART NAME	Q'TY	DESCRIPTION	REMARK
1	97SB370700	S REEL AS	1		
2	97SB370800	T REEL AS	1		
3	97S3027800	SPG TENSION	1	SWP-B	
4	97S2708400	GEAR TENS ADJ	1	POM NTR	
5	97SA475500	TENSION ARM AS	1		
6	97S2616900	CAP IMPEDANCE	1	POM NTR	
7	97S3706300	ROLLER IMPED	1	POM NTR	
8	97S4004600	BUSH IMPEDANCE	1	C3604 BD	
9	97S3114700	WASHER LIMIT	1	SUS 316	
10	97S3028800	SPG IMPEDANCE	1	SUS 304 WPB	
11	97S0437600	COVER BAND	1	SUS 304 CSP T0.3	
12	97S3027900	SPG MAIN BRAKE	1	SUS 304 WPB	
13	97S2615900	CAP LEVER	4	POM BLK	
14	97S2615700	BRAKE S	1	POM BLK	
15	97S2615600	BRAKE SUB	1	POM BLK	
16	97S2615800	BRAKE T	1	POM BLK	
17	97S2615500	LEVER RIFLE	1	POM BLK	
18	97S2616500	LEVER LOCK	1	POM BLK	
19	97S3028700	SPG IDLER LOCK	1	SUS 304 WPB	
20	97S2616400	LEVER ADJUST	1	POM BLK	
21	97SB372400	PINCH ARM AS	1		
22	97S3115800	WASHER CUT	1	D1.6×D4.0×T0.4	
23	97S5702100	STOPPER GUI ARM	1	SUS 304 CSP T0.25	
24	97SB372400	GUIDE ARM AS	1		
25	97S2615400	LEVER CONNECT	1	POM NTR	
26	97SB370500	FPC T AS	1		
27	97SB370400	FPC S AS	1		
28	97SB116000	WASHER CUT	1	D0.85×D2.5×T0.2	
29	97SB371900	MODE LEVER AS	1		
30	97S3115900	WASHER CUT	1	D1.2×D3.0×T0.3	
31	97SA475600	BAND BRAKE AS	1		
32	97S4601700	CLAMP CD SW	1	SUS 304 CSP T0.3	
33	97S2321200	HOLDER LED	1	POM BLK	
34	97S2321100	HOLDER SENSOR	2	POM BLK	
35	7001140212	SCREW MACHINE	2	PAN 1.4×2	
36	97S3114600	SCREW BAND BRK	1	M2×0.4×3	

Exploded View (III)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1	97SB370300	MAIN BASE AS	1		
2	97SA474700	GUIDE ROLLER AS	2		
3	97S3114200	SCREW SET	2	M1.4×0.2×2.1	
4	97SA474500	S POLE BASE AS	1		
5	97SA474600	T POLE BASE AS	1		
6	97S1406000	BASE LOADING	2	C1720P-1/4H T0.08	
7	7001140412	SCREW MACHINE	2	PAN 1.4×4	
8	97S3114400	SCREW ADJUST	1	M2×0.25×6.5	
9	97SB371100	WORM GEAR AS	1		
10	97S3110800	WHEEL LOAD	1	POM NTR	
11	97S3115900	WASHER CUT	5	D1.2×D3.0×T0.3	
12	97S2616200	LEVER EJECT	1	POM NTR	
13	97S2616000	BRAKE UNLOAD	1	POM NTR	
14	97S2708600	FOLLOWER CAM	1	POM NTR	
15	97S3028300	SPRING TRANS	1	SUS 304 WPB	
16	97SB372000	TRANSFER AS	1		
17	97SB371700	IDLER AS	1		
18	97SB371800	REEL GEAR AS	1		
19	97S3116000	WASHER CUT	2	D0.85×D2.5×T0.2	
20	97SB371200	CAM A AS	1		
21	97SB371300	CAM B AS	1		
22	97S3115800	WASHER CUT	2	D1.6×D4.0×T0.4	
23	97S1406100	BASE SPG	1	C1720P-1/4H T0.1	
24	97S3908100	POLY SLIDER	1	D1.6×D3.2×T0.5	
25	97S2616100	LEVER SMALL	1	POM NTR	
26	97S2708800	GEAR SMALL	1	POM NTR	
27	97S0437900	COVER T LOADING	1	SECC T0.8	
28	7001140212	SCREW MACHINE	3	PAN 1.4×2	
29	97S2617900	BRAKE SOFT	1	POM BLK	
30	97S3028400	SPRING SOFT	1	SUS 304 WPB	
31	97SB371400	GEAR A AS	1		
32	97S5501900	BELT TIMING A	1	70 TN 10-0.7T	
33	97SB371500	GEAR B AS	1		
34	97S5502000	BELT TIMING B	1	128 TN10-0.7T	
35	97SB371600	MODE PLATE AS	1		
36	97SB372200	PINCH LOCK AS	1		
37	97S3028500	SPRING PINCH LOCK	1	SUS 304 WPB	
38	97SB372300	S LOADING COVER AS	1		
39	97SB370100	S LOADING AS	1		
40	97SB370200	T LOADING AS	1		
41	97SB372100	SOFT BRAKE AS	1		